grass valley
A BELDEN BRAND

LIVETOUCH

SPORT HIGHLIGHTS & REPLAY SYSTEM

Technical Guide

Issue 2 Revision 1

2019-02-12

www.grassvalley.com

FCC Compliance

In order to comply with FCC/CFR47: Part 15 regulations, it is necessary to use Mini HDMI to HDMI high-quality triple-screened cable assemblies with integrated ferrite suppression at both ends.

Copyright and Trademark Notice

Copyright © 2019, Grass Valley Canada. All rights reserved.

Belden, Belden Sending All The Right Signals, and the Belden logo are trademarks or registered trademarks of Belden Inc. or its affiliated companies in the United States and other jurisdictions. Grass Valley, LiveTouch are trademarks or registered trademarks of Grass Valley Canada. Belden Inc., Grass Valley Canada, and other parties may also have trademark rights in other terms used herein.

Terms and Conditions

Please read the following terms and conditions carefully. By using LiveTouch documentation, you agree to the following terms and conditions.

Grass Valley hereby grants permission and license to owners of LiveTouch to use their product manuals for their own internal business use. Manuals for Grass Valley products may not be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, for any purpose unless specifically authorized in writing by Grass Valley.

A Grass Valley manual may have been revised to reflect changes made to the product during its manufacturing life. Thus, different versions of a manual may exist for any given product. Care should be taken to ensure that one obtains the proper manual version for a specific product serial number.

Information in this document is subject to change without notice and does not represent a commitment on the part of Grass Valley.

Warranty information is available from the Legal Terms and Conditions section of Grass Valley's website (www.grassvalley.com).

Title	LiveTouch Technical Guide
Part Number	Issue 2 Revision 1
Revision	2019-02-12, 08:50

Important Safety Information

This section provides important safety guidelines for operators and service personnel. Specific warnings and cautions appear throughout the manual where they apply. Please read and follow this important information, especially those instructions related to the risk of electric shock or injury to persons.

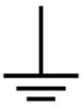
Symbols and Their Meanings

Indicates that dangerous high voltage is present within the equipment enclosure that may be of sufficient magnitude to constitute a risk of electric shock.

Indicates that the user, operator or service technician should refer to the product manuals for important operating, maintenance, or service instructions.

This is a prompt to note the fuse rating when replacing fuses. The fuse referenced in the text must be replaced with one having the ratings indicated.

Identifies a protective grounding terminal which must be connected to earth ground prior to making any other equipment connections.



Identifies an external protective grounding terminal which may be connected to earth ground as a supplement to an internal grounding terminal.

Indicates that static sensitive components are present, which may be damaged by electrostatic discharge. Use anti-static procedures, equipment and surfaces during servicing.

Indicates that the equipment has more than one power supply cord, and that all power supply cords must be disconnected before servicing to avoid electric shock.

The presence of this symbol in or on Grass Valley equipment means that it has been tested and certified as complying with applicable Underwriters Laboratory (UL) regulations and recommendations for USA.

The presence of this symbol in or on Grass Valley equipment means that it has been tested and certified as complying with applicable Canadian Standard Association (CSA) regulations and recommendations for USA/Canada.

The presence of this symbol in or on Grass Valley equipment means that it has been tested and certified as complying with applicable Underwriters Laboratory (UL) regulations and recommendations for USA/Canada.

The presence of this symbol in or on Grass Valley equipment means that it has been tested and certified as complying with applicable Intertek Testing Services regulations and recommendations for USA/Canada.

The presence of this symbol in or on Grass Valley product means that it complies with all applicable European Union (CE) directives.

The presence of this symbol in or on Grass Valley product means that it complies with safety of laser product applicable standards.

Warnings

A warning indicates a possible hazard to personnel, which may cause injury or death. Observe the following general warnings when using or working on this equipment:

- Appropriately listed/certified mains supply power cords must be used for the connection of the equipment to the rated mains voltage.
- This product relies on the building's installation for short-circuit (over-current) protection. Ensure that a fuse or circuit breaker for the rated mains voltage is used on the phase conductors.
- Any instructions in this manual that require opening the equipment cover or enclosure are for use by qualified service personnel only.
- Do not operate the equipment in wet or damp conditions.
- This equipment is grounded through the grounding conductor of the power cords. To avoid electrical shock, plug the power cords into a properly wired receptacle before connecting the equipment inputs or outputs.
- Route power cords and other cables so they are not likely to be damaged. Properly support heavy cable bundles to avoid connector damage.
- Disconnect power before cleaning the equipment. Do not use liquid or aerosol cleaners; use only a damp cloth.
- Dangerous voltages may exist at several points in this equipment. To avoid injury, do not touch exposed connections and components while power is on.
- High leakage current may be present. Earth connection of product is essential before connecting power.
- Prior to servicing, remove jewelry such as rings, watches, and other metallic objects.
- To avoid fire hazard, use only the fuse type and rating specified in the service instructions for this product, or on the equipment.
- To avoid explosion, do not operate this equipment in an explosive atmosphere.
- Use proper lift points. Do not use door latches to lift or move equipment.
- Avoid mechanical hazards. Allow all rotating devices to come to a stop before servicing.

- Have qualified service personnel perform safety checks after any service.

Cautions

A caution indicates a possible hazard to equipment that could result in equipment damage. Observe the following cautions when operating or working on this equipment:

- This equipment is meant to be installed in a restricted access location.
- When installing this equipment, do not attach the power cord to building surfaces.
- Products that have no on/off switch, and use an external power supply must be installed in proximity to a main power outlet that is easily accessible.
- Use the correct voltage setting. If this product lacks auto-ranging power supplies, before applying power ensure that each power supply is set to match the power source.
- Provide proper ventilation. To prevent product overheating, provide equipment ventilation in accordance with the installation instructions.
- Do not operate with suspected equipment failure. If you suspect product damage or equipment failure, have the equipment inspected by qualified service personnel.
- To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.
- This unit may have more than one power supply cord. Disconnect all power supply cords before servicing to avoid electric shock.
- Follow static precautions at all times when handling this equipment. Servicing should be done in a static-free environment.
- To reduce the risk of electric shock, plug each power supply cord into separate branch circuits employing separate service grounds.

Electrostatic Discharge (ESD) Protection

Electrostatic discharge occurs when electronic components are improperly handled and can result in intermittent failure or complete damage adversely affecting an electrical circuit. When you remove and replace any card from a frame always follow ESD-prevention procedures:

- Ensure that the frame is electrically connected to earth ground through the power cord or any other means if available.
- Wear an ESD wrist strap ensuring that it makes good skin contact. Connect the grounding clip to an *unpainted surface* of the chassis frame to safely ground unwanted ESD voltages. If no wrist strap is available, ground yourself by touching the *unpainted* metal part of the chassis.
- For safety, periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms.
- When temporarily storing a card make sure it is placed in an ESD bag.
- Cards in an earth grounded metal frame or casing do not require any special ESD protection.

Battery Handling

This product includes a backup battery. There is a danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions. Before disposing of your Grass Valley equipment, please review the *Disposal and Recycling Information* appendix.

Cautions for LCD and TFT Displays

Excessive usage may harm your vision. Rest for 10 minutes for every 30 minutes of usage.

If the LCD or TFT glass is broken, handle glass fragments with care when disposing of them. If any fluid leaks out of a damaged glass cell, be careful not to get the liquid crystal fluid in your mouth or skin. If the liquid crystal touches your skin or clothes, wash it off immediately using soap and water. Never swallow the fluid. The toxicity is extremely low but caution should be exercised at all times.

Recycling

European (CE) WEEE directive.

This symbol on the product(s) means that at the end of life disposal it should not be mixed with general waste.

Visit www.grassvalley.com for recycling information.

On Receipt of the LiveTouch System

The equipment is supplied in dedicated packaging provided by the manufacturer and should not be accepted if delivered in inferior or unauthorized materials.

Carefully unpack the system components and check them against the packing list. If there is anything incorrect notify your Grass Valley Partner, or Grass Valley, at once. Check that the equipment has not been damaged in transit. If any damage has occurred notify your Grass Valley Partner (or Grass Valley directly) and the carrier immediately. Always retain the original packing materials if possible, they could prove useful should it ever be necessary to transport or ship the system units.

Always read the Installation Manual and the User Guide (separate manual) carefully, it will provide you with helpful hints and tips about care and maintenance and help you get the most out of your LiveTouch system.

In the unlikely event of an equipment failure, contact your Grass Valley Partner, or Grass Valley, at once, contact details are at the rear of this manual.

Table of Contents

1 Introduction 1

About this Manual 1
New Features Available in LiveTouch version 1.10 2
Overview of LiveTouch System Components 3
LiveTouch Server 3
LiveTouch Panel 3
LiveTouch Desktop Client PC 3
LiveTouch ISA 3
LiveTouch Manager VM 4
LiveTouch Search VM (Web Bin) 4

2 LiveTouch Server (sQ1000 Series) 5

Overview 5
Summary of the LiveTouch Server Features 5
LiveTouch Server Design Considerations 7
Configuration Constraints 8
LiveTouch Server Features (sQ1000) 9
Super Slow-motion Functions 9
Overview 9
Supported SSM Cameras 9
Configuring SSM on the LiveTouch Server 10
Starting a Recording 11
Using a SSM Recording 12
Always-in-Record (AiR) Server Functionality 12
Configuring AiR on the LiveTouch Server 12
Space/Buffer Management 13
Pausing AiR Recording 14
Server Restarts 15
Momentary Restarts 16
Restart Following a Long Server Shutdown 16
Behavior When Stopping AiR Recordings 16
AiR Additional Information 17
Avalon3/Merlin2 Interface Cards 18
An Overview of the Video Processing Card - Avalon Series 18
CODEC Processing Modules - Merlin Series 18
Rear Panel SDI Input/Output Connections 19
Avalon3 20
Merlin2 20
Avalon Hardware Configurations (sQ Server 2.3 release) 21
Avalon2/Merlin1 Configurations 21
Avalon3/Merlin2 Configurations 23

Required System Licenses 24
Optional System Licenses 24
Supported HBR Formats 25
Supported LBR Formats 26
Supported Audio Formats 26
Popular sQ Server Configurations with Avalon2 27

3 Connecting the LiveTouch Components 29

Overview 29
LiveTouch Server Connectors 30
Connecting the LiveTouch Server 35
LiveTouch Server Storage 37
sQ 1200 Video Server 38
sQ 1800 Video Server 38
Connecting External Storage to an sQ 1800 LiveTouch Video Server 38
LiveTouch Server Interface Cards 39
Starting the LiveTouch Server 40
Setting the LiveTouch Server IP Addresses 43
LiveTouch Panel and Desktop Client Connectors 45
LiveTouch Desktop Client PC Connections 46
LiveTouch ISA Connectors 47
LiveTouch ISA Connections 48
LiveTouch System Cabling 49
Ethernet Network Cabling 49
Power Cabling 49

4 Environment and Location 51

Environmental Considerations 51
Rack-mounting Considerations 51
Mounting the Video Server and ISA(s) into a 19 inch Rack 52
Component Cooling 52
Air Flow through the LiveTouch Server and ISA(s) 52
Airflow Through the Panel 53
Airflow through the Desktop Client PC 53

5 Power Supplies 55

Internal Power Supplies 55
Checking the Power Supplies 56
External Power Supplies for Other LiveTouch Components 57

6 Software Installation and Configuration 59

Overview 59
Installation and Configuration Checklist 60
Before You Start 61
Check the Status of the LiveTouch Server 62
Installing the ISA Manager Software 64

Checking the Installation of the ISA Manager 75
Installing and Configuring the VMs on the ISA 77
Configuring the Search VM 77
Installing the MySQL Database for the LiveTouch Manager VM 79
Configuring the MySQL Database for the LiveTouch Manager VM 82
Installing the Chrome Browser Software 87
Installing the LiveTouch Manager VM Software 88
Setup the IP Address of the Desktop Client PC 93
Initialize the MySQL Database for the LiveTouch Manager VM 94
Configuring the LiveTouch Manager VM 95
Installing the Security Dongle on the Desktop Client PC 97
Setting the IP Address of the LiveTouch Panel 98
Set-up Comms Between Panel and Desktop Client 99
Checking the Installation of the LiveTouch Manager 99
Installing the LiveTouch Web Bin Software 100
Setting-up the Web Bin on the ISA Manager 100
Setting-up the Web Bin on the LiveTouch Desktop Client 103
Setting-up the Web Bin on the LiveTouch Panel 105
LiveTouch Unable to Read Dongle Locking Code 106
Setup LiveTouch Starring and Tagging 107
Loading Event Tag Sheets and Roster Files 107
Configuring User Rules in LiveTouch 108

7 Specifications 111

Overview 111
LiveTouch Server Specifications 111
LiveTouch Server Interface Cards 113
Maximum Number of Channels 115
Supported SDI Standards 115
Supported Video Compression Formats 116
Supported Proxy Compression Formats 116
Supported Audio Formats 117
Environmental Specifications 117
Power Specifications 117
Reference Signal Specifications 118
Storage Option Specifications 119
LiveTouch ISA Manager Specifications 120
Desktop Client PC Specifications 123
LiveTouch Panel Specifications 126

8 Product Support 129

Providing Information to Grass Valley 129
Basic Information 129
Software Application 129
Your Contact Details 129
Customer Support 129

1 Introduction

About this Manual

This technical guide will help you through each stage of the physical installation of each component of your LiveTouch system and advise you of all relevant safety aspects. For user configuration and operating information, consult the *LiveTouch User Guide*.

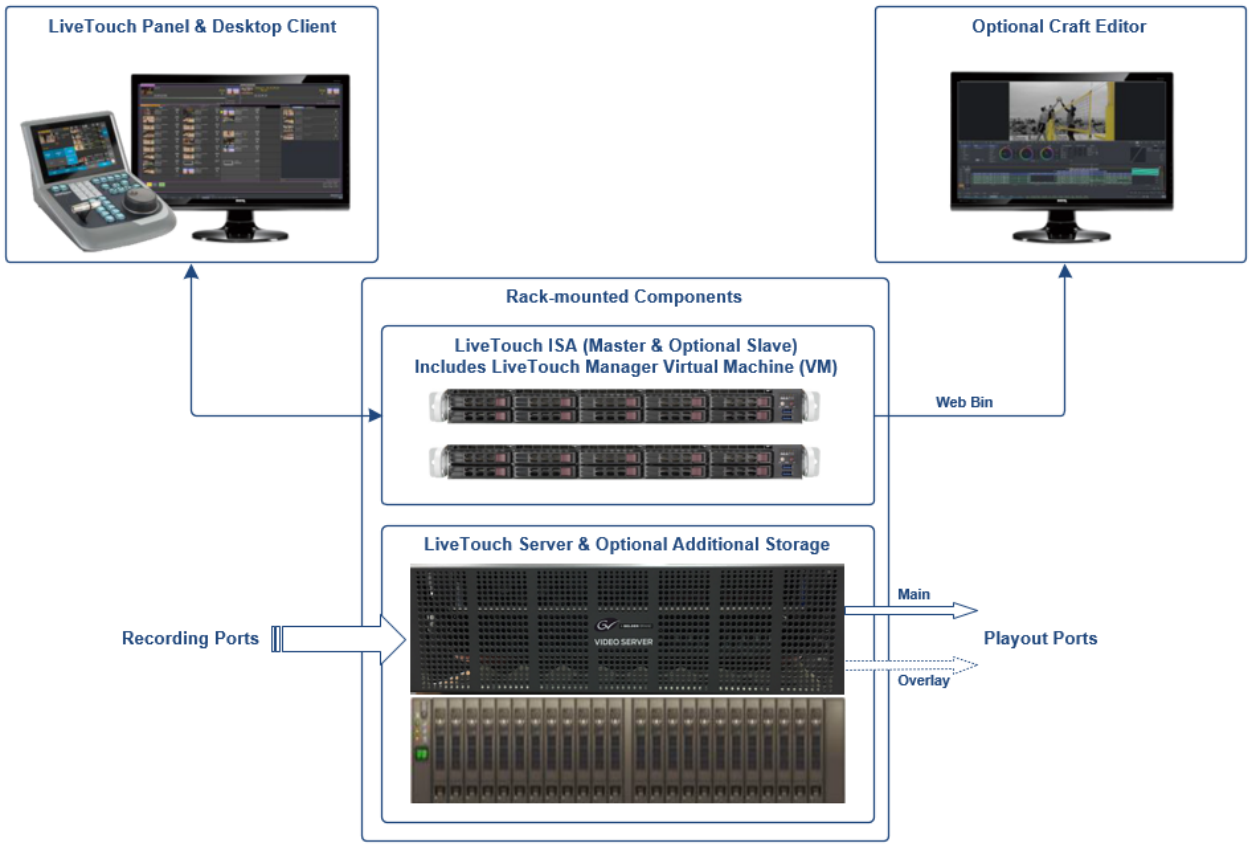


Fig. 1-1: Overview of LiveTouch System Components

If you have any questions about the installation of your product, refer to the contact details listed at the rear of this guide.

Note: All diagrams are for illustrative purposes only and may differ slightly from the purchased product. Grass Valley operates a policy of continuous improvement and development. Grass Valley reserves the right to make changes and improvements to any of the products described in this document without prior notice.

New Features Available in LiveTouch version 1.10

The following new features are provided with a LiveTouch version 1.10 system:

- Features supported only on Avalon3/ Merlin2 interface card configurations
  - Super slow-motion camera support, including:
    - 1080i, 720p and 1080p Level-A
    - Speeds: x2, x3 and x4
    - Cameras: Sony BPU-4000, Grass Valley LDX 86, Panasonic HC-5000
    - Applies to LiveTouch systems only.
  - UHD Ingest and Playout:
    - One UHD Ingest Channel and one UHD Output Channel
  - Three Input / three Output Avalon card configurations
  - Two Clean and Overlay output channel card configuration.
- HD 720p H.264 Browse for recordings on UHD Input Channel
- V-Fade transitions in LiveTouch for both video and audio tracks.
- Timecode discontinuity enhancements
- Split-audio support in LiveTouch
- Always-in-Record (AiR) enhancements
- Playout ports free-up space on the recording server when AiR ports are stopped and reset
- Nested loops in LiveTouch playlists
- Time from last marked out point added to the overlay display.
- New **Components Fitted** webpage available on the server.

Overview of LiveTouch System Components

LiveTouch Server

The LiveTouch server is a high performance video server with optional 10 GbE connectivity. The server provides SDI recording, storage and playout of clips using the network connected LiveTouch Panel and Desktop Client PC. The LiveTouch Server features video overlays, cross- fades, audio mixing for live SDI file ingest and playback.

LiveTouch Panel

LiveTouch features a dedicated, hardware control panel. Its intuitive touchscreen provides quick clip selection, speed tools and configurable user options. The panel features familiar button placement as well as a number pad for fast navigation by clip number and timecode. The responsive jog wheel provides agile clip navigation and the high-precision T-bar enables precise control of slow-motion playout.

In addition, the LiveTouch Panel touchscreen provides enables intuitive highlight creation, navigation and playlist building. The LiveTouch Panel can also host third party web applications such as RT Software's tOG Sports for enhanced live sports workflows.

LiveTouch Desktop Client PC

The LiveTouch Panel is paired to a LiveTouch Desktop Client PC, which is offered as turnkey hardware or as a software only option. The LiveTouch Client software runs on Windows 7 or Windows 10, as required. The LiveTouch Desktop PC acts as the intermediary between the LiveTouch Panel and LiveTouch Manager, passing commands over the network to execute playback operation.

LiveTouch ISA

The LiveTouch Integrated Server Architecture (ISA) system is the LiveTouch system component which organizes one or more LiveTouch Video Servers to achieve maximum performance while being tolerant of failures in individual components.

The system can be divided into one or more Zones, each of which has a single or dual-redundant ISA and one or more LiveTouch Video Servers, each having one or more Pools of RAID disks, and zero or more Video Channels.

The ISA Manager stores all the Metadata of all clips in its Zone in a well-protected directory. For user purposes it functions as a single database of all the clips held in that Zone, even though it may be implemented by a number of different computers to ensure reliability. Each clip in a Zone is allocated a unique Clip ID when it is created. The ISA stores the following Metadata items required to describe a Clip:

- ClipID
- Title
- Date of creation.

LiveTouch Manager VM

The LiveTouch Manager is installed as a VM on the ISA Manager. Clients communicate with the LiveTouch Server through the LiveTouch Manager enabling users to access recordings, playout ports, clips and playlists.

LiveTouch Search VM (Web Bin)

The LiveTouch Search engine, which provides the Web Bin functionality, is also installed as a VM on the ISA Manager. The LiveTouch Web Bin allows operators to search, access and share clips and playlists across the system.

2 LiveTouch Server (sQ1000 Series)

Overview

The LiveTouch Server is based on the family of Grass Valley sQ Server platforms, which form the core of Grass Valley's fast turnaround news production and replay systems. The Server provides SDI input and output, browse generation and storage infrastructure for the LiveTouch system.

Each LiveTouch Server is factory configured as an SD (standard definition), HD (high definition) or UHD (ultra-high definition) networked distribution server employing industry standard compression systems. A number of different models are available to suit your requirements, dependent on:

- Physical size of the server platform
- Type and amount of disk storage
- Amount of SD, HD and/or UHD material that needs to be stored
- Number of ports required for ingest or play-out
- Compression requirements.

The following three main options are available for the LiveTouch Server:

LiveTouch Server	Components
LiveTouch 1200	• LT Server Internal Storage (not included) Mainframe, • Internal Storage (8x Disk)
LiveTouch 1800	• LT Server External Storage (not included) Mainframe, • External SAS Array
LiveTouch 12G	• LT Server Internal Storage (not included) Mainframe, • Customer Kit, LTC Cable & Server Software, New Back panel • 12G Ready • Internal Storage only

The LiveTouch Server manages both SDI Ingest and Playout at resolutions of 720/1080i, 1080p or UHD, depending on your selected configuration. Up to 25.6 TB of internal SSD storage can be supplied as required. The Server can work independently or in combination with other LiveTouch servers, with its compact design occupying only three rack units.

Summary of the LiveTouch Server Features

The following table summarizes the main features of the LiveTouch Server:

Item	Description
General	
Video Ports	• Up to 12 HD • Up to 4 UHD
Clipnet Network Options	• 4x 1G (standard) • 2x 10G (option)
Native Multi-format Support	• AVC Intra, DVC Pro HD, DnXHD (configuration dependent) • XAVC Class 300 (UHD) • H.264 Proxy (640 x 360 or 720p)
Redundancy	• Dual-redundant PSUs
UHD Features	
Four UHD channels per server	• 4 x 3G SDI (2SI or SQD), or • 1 x 12G
Storage and Processing	Stored and processed as XAVC Class 300 UHD • Single frame raster
Multi-channel Packages	Easily network servers together for LiveTouch • 8 or 12 channel packages
Browse	• H.264 and 720p browse workflows for editing and remote access
Agile Codec Support	
Resolution Independent Inputs and Outputs	• 1080i, 720p, 1080p, UHD
Dynamic upscaling on output	• Set output resolution, with codecs processed on the fly

LiveTouch Server Design Considerations

When defining your LiveTouch Server, consider the following steps:

Item	Description
Step 1- Determine which Mainframe is Required	
sQ1200 or sQ1800	Select mainframe from: • sQ1200 - Internal Storage • sQ1800 - external storage.
Step 2 - Select the Clipnet-3 (network card) performance	
Clipnet-3 media network	• Performs file transfers, inter-server streaming and client access. • Third-party PCI Express Card • Tuned for high performance.
	Available Options: • Quad 1 GbE Copper • Dual 10 GbE Copper • Dual 10 GbE Fiber
Step 3 - Select SDI Video Processing Cards (Avalon2 or Avalon3)	
Terminology	• Avalon2/3 = Video Card • Merlin1/2 = Codec Processing Modules
Available Models	• Avalon 2/Merlin 1 (Legacy) • Avalon 3/Merlin 2 (UHD & Reconfigurable)
Configurations Supported	• Four Avalon Slots per Server • Up to three Merlin Modules per card depending on selected configuration.
Input/Output	• Quad HD-SDI per Avalon3 card • 4 uni-directional UHD feeds per server • Support reconfiguration to HD or UHD (4K)
Step 4 - Select Merlin1/Merlin2 Codec Modules	
Relation to Legacy Hardware	• New Merlin2 FPGA CODEC module • Still uses same chassis, power, host PC and storage
Avalon2/Merlin1 Video Encoding	• AVC Intra Class 50 & 100 (Refer to Specification for types) • 4:2:2, 10 bit • 16 channel audio
Avalon3/Merlin2 Video Encoding	• AVC Intra Class 100 • DNxHD (Refer to Specification for types) • XAVCi Class 50 & 100 • XAVCi Class 300 (UHD)
Avalon3/Merlin2 Supported Configurations	• LiveTouch UHD/HD Input Card-1x UHD or 3x HD • LiveTouch UHD/HD Output Card with Overlay - 1x UHD or 2x HD
Step 5 - Select Storage type and capacity (HDD or SDD)	
sQ 1200 Internal Array	• 1 x RAID 3 using 8 disks, with 1 parity disk
sQ 1800 External Array	• 3 x RAID 3 arrays (RAID 30). 8 disks, with 1 parity disk per RAID.

Configuration Constraints

The following table provides a comparison between the functions of the two versions of the Avalon Video Card.

	Avalon2/Merlin1	Avalon3/Merlin2
Maximum Merlins / Avalons	• 3	• 3
SD/HD Codecs	• IMX 30/40/50 • DVCPRO 25/50 • XAVCi Class 50/100 • AVCi Class 50/100 • DVCPRO HD 720p/1080i/1080p • 8/10-bit	• XAVCi Class 100 • AVCi Class 100
UHD Codecs	Not Supported	XAVC Class 300
Number of HD Inputs/Outputs	• 4	• 3 [a]
Number of 3G Inputs/Outputs	• 2	• 3
Browse Engine Supported	• Yes	• No

a. **Note:** Four HD inputs/outputs will be supported by end February 2019.

Additional constraints and considerations:

- UHD requires Avalon 3
- Browse Generation for Client Seats on Input
  - H.264 Browse Always Generated on Ingest
- Browse Regeneration required for "Delta Frames"
  - Browse Regeneration done either on Avalon Card or at point of ingest (edge browse)
- Mixed configurations of Avalon 2 and Avalon 3 cards on the same Server are not permitted.
- LiveTouch output ports always include mirrored Overlay output
- Limit of four LiveTouch Playout ports per Server

LiveTouch Server Features (sQ1000)

The LiveTouch Server key features include the following:

- Super-Slow-Motion support
- Always-In-Record (AiR) enhancements
- Avalon3/Merlin2 card set
- UHD support
- HD Browse for UHD Recordings
- V-Fade Transitions in LiveTouch
- Timecode Discontinuity Enhancements
- Split Audio Support in LiveTouch
- Enhanced Loop Support in LiveTouch Playlists

These features are described in more detail in the following sections.

Super Slow-motion Functions

Overview

The **Super Slow-motion (SSM)** functionality enables the LiveTouch Server to record and play SSM feeds at speeds of up to x4.

Note: Level B feeds are not yet supported; planned for a future release.

SSM recordings can be controlled either by sQ Record, automation or Always-in-Record. SSM feeds are specifically for use by LiveTouch, other Grass Valley products are not supported.

This functionality is supported in sQ1000 series servers running version 2.3, with license **SSM x4 Camera (171)**.

SSM is only supported in sQ1000 servers using the Avalon3 / Merlin2 card sets.

The SSM camera control unit must be locked to the same video reference as the server, as asynchronous SSM feeds are not supported.

Supported SSM Cameras

Super slow-motion cameras are defined as those cameras and their associated control units which support SDI I/O capable of real-time delivery. SSM cameras can capture images at up to x12 the HD rates. This does not include Hyper-motion cameras that typically capture to a RAM buffer and output at a later point in time.

The following SSM cameras are supported:

Cameras	x2 100i/119i 1080i 2x1.5G	x2 100p/119p 1080p 2x3G Level A	x3 150i/179i 1080i 3x1.5G	x3 150p/179p 1080p 3x3G Level A	x3 150p/179p 1080i 4x1.5G	x4 200i/239i 1080i 4x1.5G	x4 200p/239p 1080p 4x3G Level A	x6 300i/359i 1080i 6x1.5G	x6 300p/359p 1080p 6x3G Level A	x8 400i/479i 1080i 8x1.5G	x8 400p/479p 1080p 8x3G Level A
Sony BPU-4000 • HDC-4800 • HDC-4300 • F65 • PMW-F55	Y	Y	Y	Y		Y	Y				
Grass Valley LDX 86			Y	Y	Y						
Panasonic HC-5000							Y				

Configuring SSM on the LiveTouch Server

Configure SSM on the LiveTouch Server as follows:

1 Open the LiveTouch Server web page: http://<*Server_IP_Address*>

2 Select: **Configure > Ingest/SSM**

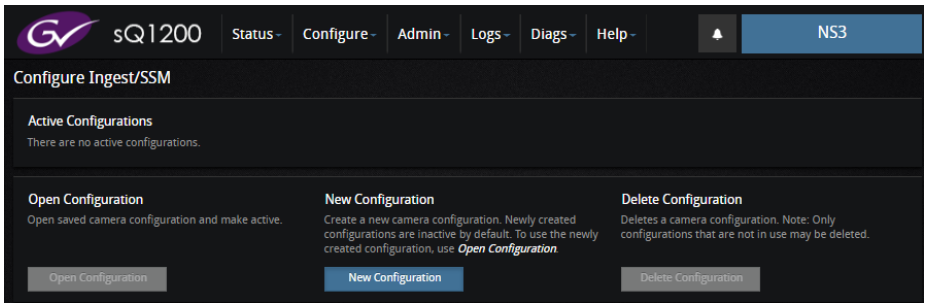


Fig. 2-1: LiveTouch Server - Configure Ingest/SSM Entry Dialog

3 Click the **New Configuration** softkey to define a new SSM configuration. This opens the New Configuration dialog box:

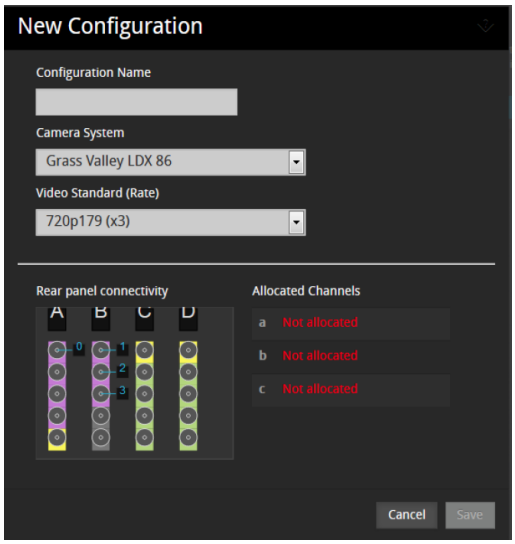


Fig. 2-2: LiveTouch Server - Super Slow-motion Configuration

4 Enter a name for the configuration into the **Configuration Name** field.

5 Select the camera system from the drop-down list:

- Grass Valley LDX 86
- Panasonic HC-5000
- Sony HDC-4300 + BPU-4000
- Sony HDC-3300 + BPU-4000

6 Select the Video Standard (rate) from the drop-down list, for example: **720p179 (x3)**.

7 In the Rear panel connectivity matrix, click the number of ports required for the selected rate, e.g., for three cameras you need to select 3 BNC connectors

All record ports currently configured on the system are highlighted using a pink background. The blue numbers refer to the corresponding port number.

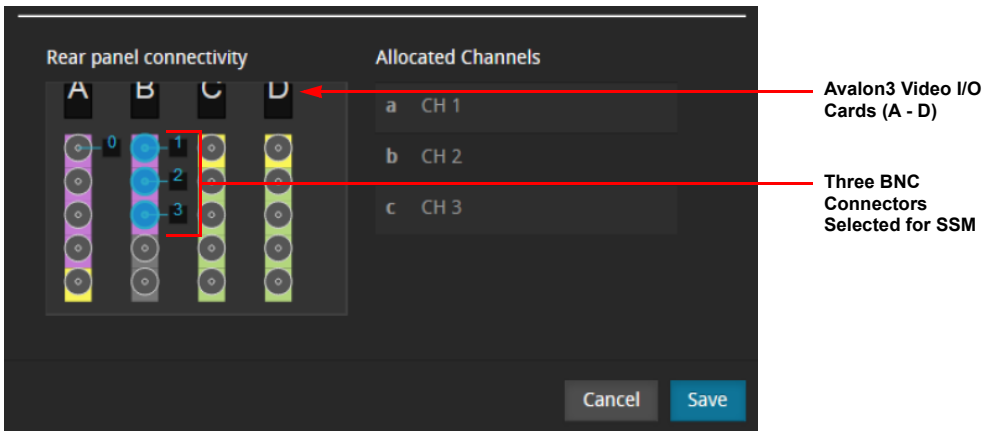


Fig. 2-3: LiveTouch Server - Selecting SSM Record Ports

8 Click Save to save your SSM configuration.

9 Click Open Configuration to load your SSM configuration onto the system.

The SSM functions should now be active on your LiveTouch system.

Starting a Recording

Once the configuration is active, you can control the SSM recording by the lowest numbered port selected in the New Configuration menu. In the example shown in Figure 2-3, the recording is controlled by **Port 1**. When Port 1 is put into record all other ports relating to the SSM feed (slave ports) are also put into record.

The settings in the **SDI Channel Configuration** page for the selected control port are used. These settings should match the chosen SSM format e.g., select 1080i record formats for a 1080i SSM format, etc. The settings for the other SSM slave ports are taken from the control port.

If you are also using Always-In-Record (AiR) then you can start the recording using the setting in the SDI Channel Configuration page for the selected control port. Alternatively,

you can also start an SSM recording from the LiveTouch panel by selecting the SSM control port.

Using a SSM Recording

When using AiR to record the SSM feed, select the Live softkey in the LiveTouch Home screen and select the appropriate SSM control port.

- When playing at x1 output, only phase 0 of the SSM feed is used.
- When playing at about the notional rate, all phases of the SSM feed are used i.e., playing a x3 feed at 33% uses all three phases of the feed.

Always-in-Record (AiR) Server Functionality

The Always-In-Record (AiR) functions of the LiveTouch Server enable you to put the server record ports into record mode, allowing them to record all material on the selected port continuously. Storage space is freed by deleting old, unused material which is used for upcoming storage requirements.

This functionality is supported in sQ1000 series servers running V1.7, V2.2 and V2.3.

Version 2.3 software introduces the following changes:

- Record and pause
- Changed behaviors after the server has been switched off for some time
- Changed behaviors when stopping a recording.

The following sections describe the AiR functionality in more detail, from the perspective of the server. For information on using AiR in the LiveTouch system, see the *LiveTouch User Guide*.

Configuring AiR on the LiveTouch Server

Configure AiR on the LiveTouch Server as follows:

1 Open the LiveTouch Server web page: http://<*Server_IP_Address*>

2 Select: **Configure > SDI Channels**

The SDI Channel Configuration web page enables you to set the following parameters for each record port:

- Always in Record: Switch AiR on or off. When set to **On**, the port is in AiR mode and recording will start. When set to **Off**, AiR mode is disabled. Any recording is stopped when changing the setting to Off. When Off the port is available for use by other applications. When On, the port cannot be used by other applications. If the server is restarted with AiR set to On, then, after running up, the port will restart the recording, see Record Persistence below.
- Record Buffer Length: Set the minimum length of the recording buffer in hours and minutes. For example, if the buffer is set to 3 hours,

then after recording for 3 hours there will always be a history of at least the last 3 hours of recorded material. **Note:** At times there may be a buffer of more than 3 hours due to the timing of the extend and trim process.

- Default Port Name: Assign a default name to each AiR record port and consequently to the AiR recording. The name must be unique across all the server's AiR ports. This name appears in the LiveTouch user interface when selecting and using the AiR recordings.
- Record Persistence: When switched on enables port record persistence after a server reboot. This setting affects the behavior of the AiR recording after the server has been restarted. When set to **On**, if the server has restarted with the port in AiR mode, then the recording is restarted with the same identity as it had before the restart. When set to **Off**, if the server is restarted with the port in AiR mode, then the server starts a new recording with a new identity. All unprotected, previously recorded material will be lost. The new recording will need to be added back into the LiveTouch UI. It is recommended that this setting set to **On**.

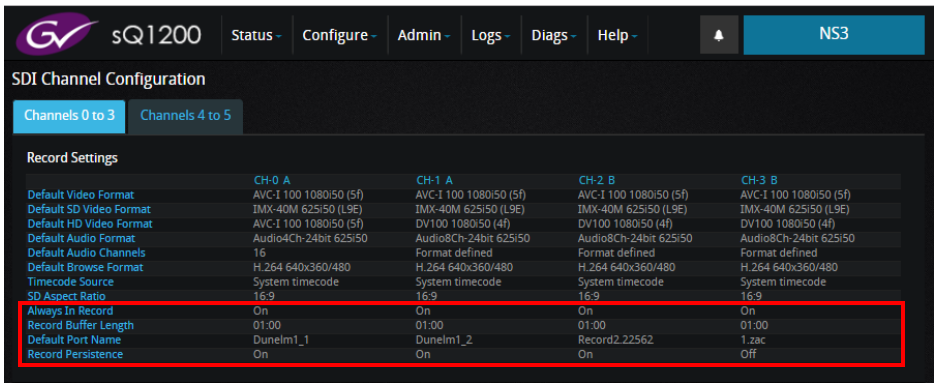


Fig. 2-4: LiveTouch Server - AiR Configuration

> **Note:** You can also configure the AiR ports using the Ingest tab of the LiveTouch Panel Home screen. See the *LiveTouch User Guide* for more information.

3 Exit from the SDI Channel Configuration web page to save your settings.

Space/Buffer Management

On setting up an AiR recording the server allocates a record buffer with a user-defined minimum length. Over time, the oldest parts of the recording are freed to make space for the current recording, giving the appearance of recycling buffer space. The implementation

of AiR, however, is that space in the buffer is not actually re-used, rather buffer space is freed-up and new space is allocated.

The record buffer is of a fixed length, with separate buffers for video, browse and audio. As the record head nears the end of the buffer, a new allocation is appended and the rear of the buffer is trimmed back accordingly.

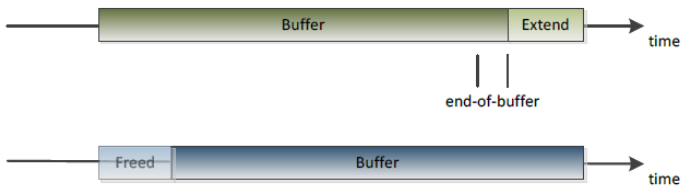


Fig. 2-5: Schematic of Air Buffer Usage

Any sub-clips that have been made in LiveTouch will lock the space they use. Assuming that free space is available, the server will extend the buffer as usual. An algorithm on the server decides how much of the buffer is extended or freed-up.

Note that the buffer size can be increased using the setting described previously, while the AiR port is recording. The recording does not have to be stopped or paused in order to increase the buffer size. In addition, you could use automation to increase the buffer size.

Pausing AiR Recording

This feature has been added in the sQ1000 version 2.3 software and enables the AiR recording to be paused.

The LiveTouch server preserves all material recorded before the pause, allowing the recording to continue when un-paused at a later time. When a recording is un-paused it continues from the point where it left off. A LiveTouch system that is using the AiR recording can clip material at either side of the pause. The point at which the AiR recording was paused is not visible on the LiveTouch timeline i.e., there is no need to scroll through the time at which the recording was paused.

For example, consider a scenario where a LiveTouch system is being used at multi-day sports event. With the recording ports set to AiR mode and the buffer length to 12 hours then an operator can pause the AiR recording at the end of Day 1. At the start of Day 2, the operator can continue the recording from Day 1 by un-pausing the AiR ports. The LiveTouch operators can still clip events recorded on Day 1 until the Day 2 recordings overwrite the Day 1 material.

The AiR recording can be paused either from the LiveTouch Panel Home page (see the *LiveTouch User Guide*) or from the LiveTouch server web page: **Status > Quentin Corba**.

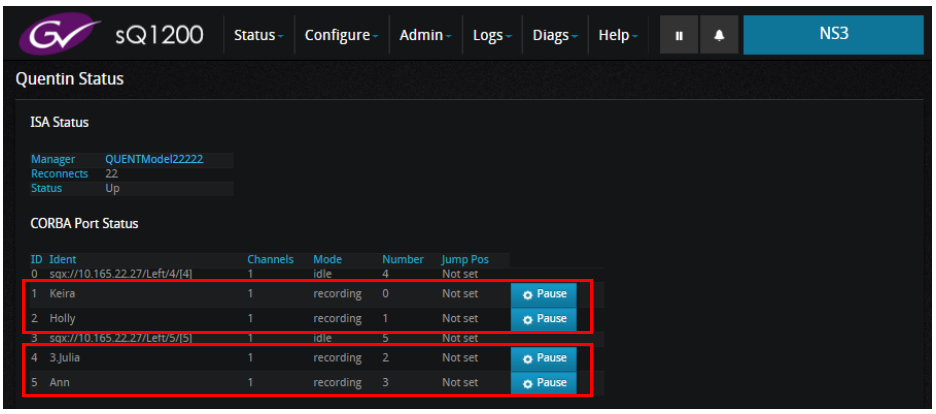


Fig. 2-6: AiR Ports in Quentin Status Dialog

> **Note:** This page is intended for engineering use only. It is expected that an authorized operator would use the pause record functions on the Home page of the LiveTouch Panel.

Pause a recording on an AiR port from the **Quentin Status** web page as follows:

1 Select the target port and click the Pause button.
This opens the pause confirmation dialog.

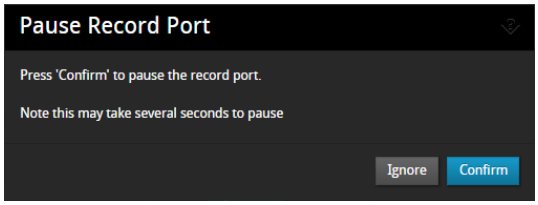


Fig. 2-7: AiR Ports in Quentin Status Dialog

2 Press Confirm to pause the AiR port.
The pause button now changes to: UnPause.
Click UnPause then Confirm to restart the recording.

AiR recording can also be paused using the WebSocket control interface and the Corba API. In addition, a Pause button has also been added to the Quentin Controller.

Server Restarts

There are two types of behavior when restarting AiR recordings after a restart or shutdown:

- Momentary restarts
- Restart After Long Server Shutdown

These are described in the following subsections.

Momentary Restarts

If the **Record Persistence** option is enabled (see Configuring SSM on the LiveTouch Server, on page 10) and the port is in AiR mode, the port behaves as follows after a server restart (e.g., a user-controlled server restart or in the unlikely event of a server crash):

- If the port was paused before the reboot it will remain paused after the reboot.
- If the port was actively recording, the recording will continue from a position depending on the length of time that the server was down. There will be no discontinuity, but there will be a section of unrecorded media over the time that the server was down.
- No action is required in the LiveTouch system.
- Black material is inserted in the LiveTouch timeline for the duration of the restart.

Restart Following a Long Server Shutdown

If the **Record Persistence** option is enabled (see Configuring SSM on the LiveTouch Server, on page 10) and the port is in AiR mode, the port behaves as follows when the server is switched on again after a period of inactivity (e.g., between events):

- If the port was paused before the shutdown, it will remain paused after the restart.
- If the port was actively recording before the shutdown, the recording will continue with a discontinuity. This behaves as though the recording was paused during the shutdown. There will be a small amount of unrecorded media between the original position and the new start position.
- At no time are clips created from the AiR recordings.
- AiR recordings are never deleted regardless of age.
- Recordings can still be used in LiveTouch.

The difference between the *Momentary Restart* behavior and this *Extended Power Off* behavior is not based on the server detecting itself being switched off and on, rather it depends on the length of time that the server is off related to the space remaining in the AiR record buffer.

For example, if the AiR record buffer is set to 24 hours and the recording has been going for 14 hours, there are 10 hours left in the buffer. If the server is switched off for less than 10 hours then the Momentary Restart behavior is used, starting at the corresponding point in the buffer.

Behavior When Stopping AiR Recordings

Note: The information in this section does not apply to pausing recordings.

When a LiveTouch output has mounted AiR recordings and the AiR recording is stopped (e.g., from the server web page or the Home page of the LiveTouch Panel) the LiveTouch playout port will clear its record proxy timeline. This will free the space on the recording server, providing sufficient space to restart the recording.

In previous software versions, the LiveTouch output ports could keep hold of the space used by recordings, even though the recording had stopped. This meant that there may not have been enough space to restart the recordings until the recordings had been dropped from all LiveTouch clients that were using them.

IMPORTANT:	In previous versions the LiveTouch client could still access the recorded material even though the recording had been stopped. **This is no longer the case.** Once the recording has been stopped the LiveTouch client will see a zero length timeline and will show black.

AiR Additional Information

- If the input signal disappears during a recording a flat purple image is recorded.
- If the input signal switches to another video format the LiveTouch Server records a flat brown color. Format conversion does not take place.
- The input will not perform frame rate conversions.
- The LiveTouch Server uses the port's default record formats as specified in the **Configure > SDI Channels** server webpage for the audio and video storage formats. Either Automation or LiveTouch can choose different formats when starting an AiR recording.
- Audio or video storage formats cannot be changed once a recording has started. The AiR recording has to be stopped in order to change formats. In addition, the formats cannot be changed while a recording is paused.
- To prevent material being overwritten, either ISA clips need to be created or they have to be clipped and saved to the LiveTouch library. LiveTouch marked events that have not been saved are not protected.
- LiveTouch can use AiR recordings to create Multicam groups.

Avalon3/Merlin2 Interface Cards

An Overview of the Video Processing Card - Avalon Series

The standard video processing card (referred to as **Avalon2**), is a highly-configurable video and audio input/output (I/O) processing system with integrated software-based video codecs. Avalon2 provides the following configurable services to the sQ server system, available in a number of combinations:

- Video channel(s): Record an SDI video stream and simultaneously encode two compressed video streams – one high-quality video (high bit rate, or HBR) and one proxy/browse (low bit rate or LBR). In playback, a video channel provides various features including jog, shuttle and other playback controls. The channel output also provides a video combiner allowing effects and cross-fades.
- Browse engine: A transcoder that decodes a high-quality compressed video stream and encodes it to a proxy compression format. It generates LBR from ingested files or from new HBR media published to the server (Delta frames).
- Thumbnail service: Decodes specified video frames from disk and used when a thumbnail API call is made.

An enhanced **Avalon3** video processing card is also available, designed to support UHD I/O. Avalon3 features additional memory and processing capabilities. **Avalon3** and **Merlin2** are new hardware cards that can be fitted into the sQ1000 series LiveTouch Server.

Avalon3 and Merlin2 sit alongside the existing Avalon2 and Merlin1 cards. These cards are supported in software versions C2.2 and V2.3.

The cards were primarily designed to add full 10 bit UHD support to the server as well as adding a UHD cross-fade capability. In addition, the 1080p port density with these cards increases significantly.

CODEC Processing Modules - Merlin Series

The Video Processing Card uses a dedicated digital signal processing (DSP) module (referred to as **Merlin1**) to encode and decode video. Up to three Merlin1 modules can be fitted to each video processing card, with at least one Merlin1 module required for each card.

With the introduction of the **Avalon3** module we now use a combination for Merlin1 and new **Merlin2** FPGA based encoding. The new Merlin2 encoder provides a significant increase in processing capability required for UHD applications.

Rear Panel SDI Input/Output Connections

Each standard Avalon Video Processing Card supports up 5 x 75 ohm SDI connections. A color-coded rear panel connection label is provided for each configuration to clearly identify inputs and outputs. Where a card is configured with no video channels (e.g., it supports only browse engines) cover boots are provided for the connectors. Figure 2-8 shows an example configuration of a standard rear panel label, rotated 90 degrees anti-clockwise from the actual orientation of the card to aid illustration.

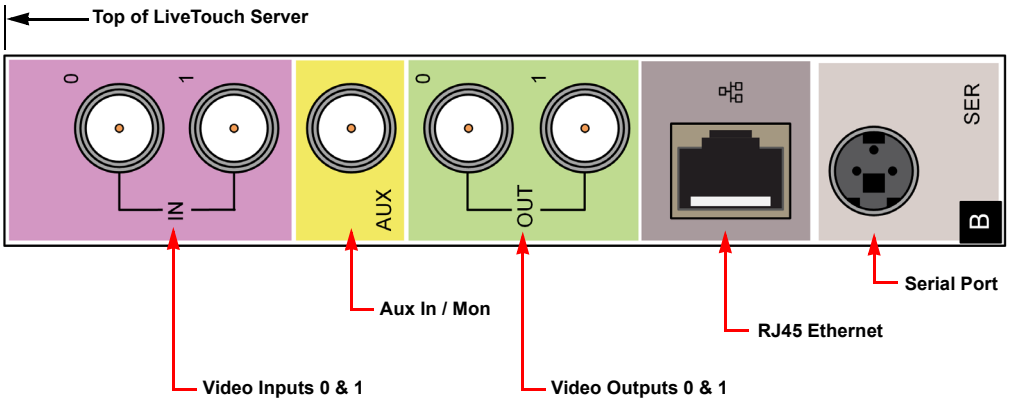


Fig. 2-8: LiveTouch Server - Rear Panel I/O Connector Color-coding (Viewed Horizontally)

Figure 2-9 shows an example configuration of a 12 G rear panel label.

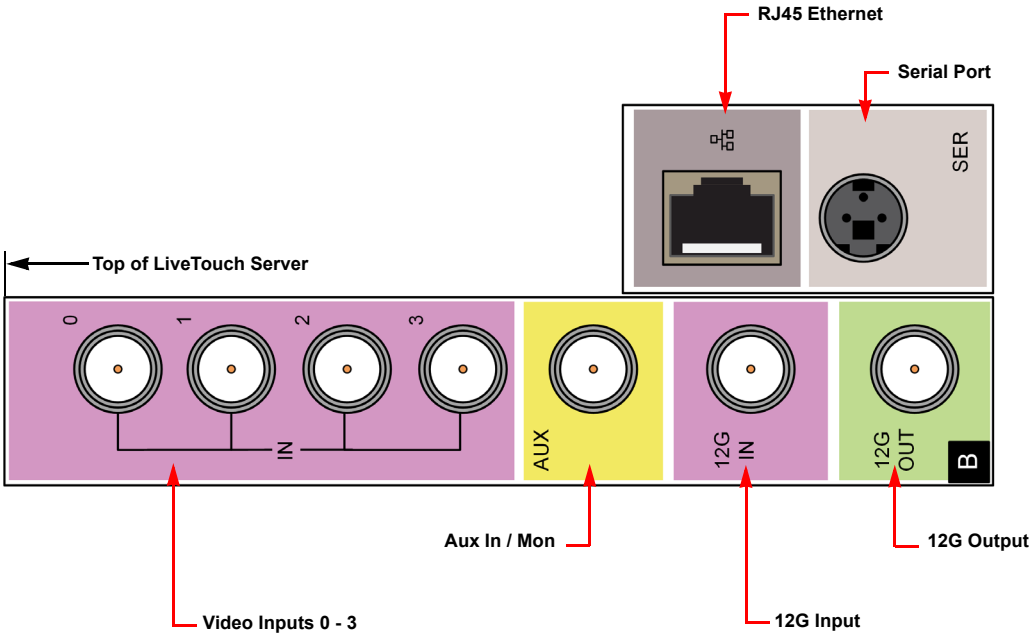


Fig. 2-9: 12G LiveTouch Server - Rear Panel I/O Connector Color-coding (Viewed Horizontally)

For details on the various supported configurations, see the *sQ 1000 Product Specification*.

A summary is also available in Avalon Hardware Configurations (sQ Server 2.3 release), on page 21.

Avalon3

Avalon3 is the new generation video processing card for the LiveTouch Server and provides support for UHD video formats.

Merlin2

The Merlin2 codec card performs the following functions:

- Video Codec
- Video Sizing
- HDR Conversions

The Merlin2 can support any of the following operations:

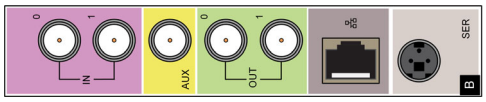
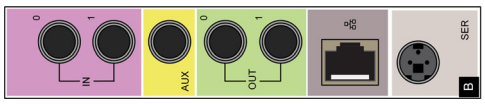
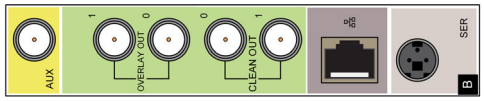
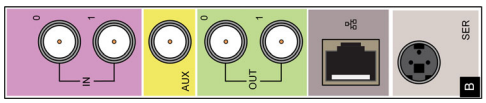
- 1 x XAVCi Class 300 UHD Encode or Decode
- 3 x XAVCi Class 100 1080p/1080i Encode or Decode
- 3 x AVCi Class 100 1080p/1080i Encode or Decode

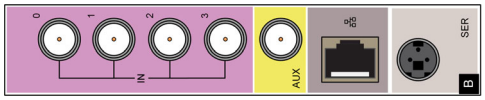
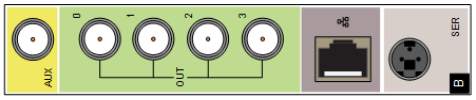
Note: The Merlin2 cannot support Class 50 XAVCi or AVCi.

Avalon Hardware Configurations (sQ Server 2.3 release)

Avalon2/Merlin1 Configurations

This table lists configurations of the Avalon2/Merlin1 cards supported by the sQ Server V2.3 release:

Avalon2 Video Processing Card Hardware Function	Number of Merlin1 Codec Modules Required	Required License For LiveTouch [a]	Optional License	Supports	Comment
2x Half Duplex SD/HD/3G Channel	3	160 – LiveTouch 161 – LiveTouch LBR	50 – AVC-I Support 56 – QXAVC-I support 57 - DNxHD support 51 – 1080p support 55 – H.264 support 61 – 16 channel audio	Cross Fades ALL SD/HD/3G Formats ALL LBR Formats	With LBR (Default MPEG1, H.264 optional)
2x Half Duplex SD/HD/3G Channel	2	160 – LiveTouch 161 – LiveTouch LBR	50 – AVC-I Support 56 – QXAVC-I support 57 - DNxHD support 55 – H.264 support 61 – 16 channel audio	Cross Fades ALL SD/HD HBR Formats ALL LBR Formats 1080p Output	With LBR (Default MPEG1, H.264 optional) No 1080p ingest support
2x Half Duplex SD/HD/3G Channel	1	160 – LiveTouch 161 – LiveTouch LBR	61 – 16 channel audio	DV100 HD Formats All SD HBR Formats MPEG1 LBR Formats	With LBR (MPEG1 only) SD/ DV100 only
2x Half Duplex SD/HD/3G Channel	2	160 – LiveTouch	50 – AVC-I Support 56 – QXAVC-I support 57 - DNxHD support 51 – 1080p support 61 – 16 channel audio	ALL SD/HD/3G Formats No LBR	No LBR LiveTouch only
2x Half Duplex SD/HD/3G Channel	1	160 – LiveTouch	50 – AVC-I Support 56 – QXAVC-I support 57 - DNxHD support 61 – 16 channel audio	ALL SD/HD Formats No LBR	No LBR LiveTouch only
					
2x Browse Engine	2	160 – LiveTouch 161 – LiveTouch LBR	55 – H.264 support	ALL LBR Formats	2.5x-3x realtime browse transcode engines (Default MPEG1, H.264 optional)
					
2x Clean output 2x Overlay (Standard LiveTouch Configuration)	2	160 – LiveTouch	-	ALL SD/HD/3G Formats	SD/HD/3G output 1080p option not required
					
2x Half Duplex SD/HD + 1 browse engine	3	160 – LiveTouch 161 – LiveTouch LBR	50 – AVC-I Support 56 – QXAVC-I support 57 - DNxHD support 55 – H.264 support 61 – 16 channel audio	ALL SD/HD Formats ALL LBR Formats	Browse engines are 1x realtime when ports are in use on that Avalon. With LBR (Default MPEG1, H.264 optional)
					

Avalon2 Video Processing Card Hardware Function	Number of Merlin1 Codec Modules Required	Required License For LiveTouch [a]	Optional License	Supports	Comment
4x Input Channel	3	160 – LiveTouch 161 – LiveTouch LBR	50 – AVC-I Support 56 – QXAVC-I support 57 - DNxHD support 55 – H.264 support 61 – 16 channel audio	SD/HD Formats only	With LBR (Default MPEG1, H.264 optional) No 1080p
4x Input Channel	2	160 – LiveTouch	50 – AVC-I Support 56 – QXAVC-I support 57 - DNxHD support 61 – 16 channel audio	SD/HD Formats only	No LBR No 1080p LiveTouch only
					
4x Output Channel	3	-	-	SD and HD Also supports SD clips up-sizing to HD output	No 1080p support. Same video output standard needs to be used on port pairs [0,3][1,2]
					
Unsupported Configurations					
3x Input Channels	-	-	-	-	-
4x Browse Engines	-	-	-	-	-

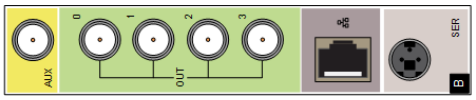
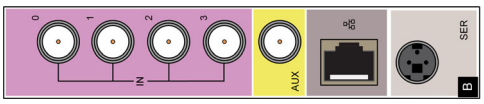
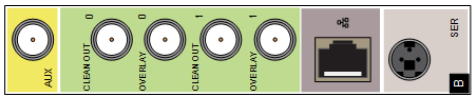
a. LiveTouch / LiveTouch LBR license(s) are only required if the server is part of a LiveTouch system (Highlights, Production, Enterprise).

You can have any combination of Avalon configurations in an sQ Server up to a maximum of 4 x Avalon Cards. Note that a UHD server supports only UHD configurations and offline browse is not supported as it will be replaced by the Avalon 3/ Merlin2 configurations.

- SD = 525/625 formats
- HD = 1080i/720p formats
- 3G = 1080p formats
- UHD = 2160p formats

Avalon3/Merlin2 Configurations

This table lists configurations of the Avalon3/Merlin2 cards supported by the sQ Server V2.3 release:

Avalon3 Video Processing Card Hardware Function	Number of Merlin2 Codec Modules Required	Number of Merlin1 Codec Modules Required	Required License	Optional License	Supports	Comment
Supported Configurations						
1x Merlin2 4K Ultra HD Output Channel	1	-	58 – Ultra HD Support	63 - HDR	HD/ 3G/ UHD	AVCI/ XAVCI Class 100 only Up-scales/ down-scales 4ch/8ch/16ch audio formats supported. Does not support LT Cross-fades
1x Merlin2 4K Ultra HD Output Channel	2	-	160 – LiveTouch 58 – Ultra HD Support	63 - HDR	HD/ 3G/ UHD LT Cross-fades	AVCI/ XAVCI Class 100 only Up-scales/ down-scales 4ch/8ch/16ch audio formats supported. Supports LT Cross-fades Supports SSM Playout
3x HD Output	1	-	-	-	HD/ 3G Only	3x Output unidirectional AVCI/ XAVCI Class 100 only HD only
						
1x Merlin2 4K Ultra HD Input Channel	1	1	160 – LiveTouch 161 – LiveTouch LBR 58 – Ultra HD Support 56 – QXAVC-I support 55 – H.264 support	61 – 16 channel audio 51 – 1080p 63 - HDR 50 – AVC-I Support 170 – SSM x2 171 – SSM x4	HD/ 3G UHD H.264 640 or 720p LBR	AVCI/ XAVCI Class 100 only All audio formats supported. H.264 (SD/ HD) browse only SSM only supported in HD formats
3x HD Input	1	1	50 – AVC-I Support 56 – QXAVC-I support 55 – H.264 support	61 – 16 channel audio 51 – 1080p 170 – SSM x2 171 – SSM x4	HD/ 3G Only	3x Input unidirectional AVCI/ XAVCI Class 100 only 4ch/8ch/16ch audio formats supported. H.264 (SD) browse only SSM only supported in HD formats
						
2x Clean output + 2x Overlay	1	-	160 – LiveTouch	-	HD/ 3GLT Cross-fades	AVCI/ XAVCI Class 100 only Up-scales/ down-scales 4ch/8ch/16ch audio formats supported. Supports LT Cross-fades Supports SSM playout
						

Required System Licenses

The following table shows the license codes required for the available configurations:

License Code	Description
1	V software
10	X software
49	T software
54	S software
65319	C software (with associated version number)
106	6 Channel License (depending on how many channels)
108	8 Channel License (depending on how many channels)
110	10 Channel License (depending on how many channels)
112	12 Channel License (depending on how many channels)
152	2 Browse Engines (depending on how many browse channels)
154	4 Browse engines (depending on how many browse channels)

Optional System Licenses

The following table shows the license codes required for the various optional configurations:

License Code	Description
50	AVCI support
51	1080p support
52	10Gb Clipnet
53	External Storage (Only required if upgrading from sQ 1200 – sQ 1800)
55	H.264 support
56	QXAVC-I support
57	DNxHD support
58	Ultra HD support
61	16 channel support
202	Cross-fades 2 ports (depending on how many cross-fade ports required)
204	Cross-fades 4 ports (depending on how many cross-fade ports required)
206	Cross-fades 6 ports (depending on how many cross-fade ports required)
160	LiveTouch support (no LBR)
161	+ LiveTouch LBR to option 160

License Code	Description
162	LiveTouch Cache
171	SSM x4

Supported HBR Formats

59.94 Hz		50 Hz	
ID	**HBR Format**	**ID**	**HBR Format**
86	IMX-30M 525i60 (L9E)	89	IMX-30M 625i50 (L9E)
87	IMX-40M 525i60 (L9E)	90	IMX-40M 625i50 (L9E)
88	IMX-50M 525i60 (L9E)	91	IMX-50M 625i50 (L9E)
710	DVCPRO50M 525i60 (8f)	512	DV100 720p50 (4f)
711	DVCPRO25M 525i60 (10f)	530	DV100 1080i50 (5f)
712	DVCHOME 525i60 (10f)	610	AVC-I 50 1080i50 (11f)
280	DV100 720p60 (6f)	611	AVC-I 100 1080i50 (5f)
281	DV100 1080i60 (6f)	612	AVC-I 50 720p50 (11f)
600	AVC-I 50 1080i60 (9f)	613	AVC-I 100 720p50 (6f)
601	AVC-I 100 1080i60 (7f)	700	DVCPRO50M 625i50 (7f)
602	AVC-I 50 720p60 (9f)	701	DVCPRO25M 625i50 (10f)
603	AVC-I 100 720p60 (7f)	702	DVCHOME 625i50 (10f)
622	AVC-I CL50 100M 1080p60 (6f)	620	AVC-I CL50 100M 1080p50 (5f)
623	AVC-I CL100 200M 1080p60 (3f)	621	AVC-I CL100 200M 1080p50 (3f)
630	QXAVC-I 50 1080i60 (9f)	632	QXAVC-I 50 1080i50 (11f)
631	QXAVC-I 100 1080i60 (7f)	633	QXAVC-I 100 1080i50 (5f)
635	QXAVC-I CL100 200M 1080p60 (3f)	634	QXAVC-I CL100 200M 1080p50 (3f)
639	QXAVC-I CL300 600M 2160p60 (3f)	638	QXAVC-I CL300 500M 2160p50 (3f)
650	DNxHD 440M 1080p60 10b (4f)	640	DNxHD 365M 1080p50 10b (4f)
651	DNxHD 290M 1080p60 8b (4f)	641	DNxHD 240M 1080p50 8b (4f)
652	DNxHD 440M 1080p60 8b (4f)	642	DNxHD 365M 1080p50 8b (4f)
653	DNxHD 220M 1080i60 10b (4f)	643	DNxHD 185M 1080i50 10b (4f)
654	DNxHD 145M 1080i60 8b (4f)	644	DNxHD 120M 1080i50 8b (4f)
655	DNxHD 220M 1080i60 8b (4f)	645	DNxHD 185M 1080i50 8b (4f)
656	DNxHD 220M 720p60 10b (4f)	646	DNxHD 175M 720p50 10b (4f)

59.94 Hz		50 Hz	
ID	**HBR Format**	**ID**	**HBR Format**
657	DNxHD 220M 720p60 8b (4f)	647	DNxHD 175M 720p50 8b (4f)
658	DNxHD 145M 720p60 8b (4f)	648	DNxHD 115M 720p50 8b (4f)
659	DNxHD 90M 1080p60 8b (4f)	649	DNxHD 75M 1080p50 8b (4f)

Note: V2.3 does not natively support XDCAM/Long GOP compression formats.

Supported LBR Formats

59.94 Hz		50 Hz	
ID	**LBR Format**	**ID**	**LBR Format**
260	MPEG-1 525i60	516	MPEG-1 625i50
311/313	H.264 640x360/480 525i60	310/312	H.264 640x360/480 625i50
315	H.264 1280x720p60	314	H.264 1280x720p50

Note: H.264 1280x720p60, only supported on Avalon3/Merlin2 based configurations.
MPEG1 not supported on Avalon3/Merlin2 based configurations.

Supported Audio Formats

59.694 Hz		50 Hz	
ID	**Audio Format**	**ID**	**Audio Format**
265	Audio4Ch-16bit 525i60	521	Audio4Ch-16bit 625i50
270	Audio8Ch-16bit 525i60	523	Audio8Ch-16bit 625i50
269	Audio4Ch-24bit 525i60	522	Audio4Ch-24bit 625i50
271	Audio8Ch-24bit 525i60	524	Audio8Ch-24bit 625i50
0	16 channel audio	0	16 channel audio

Popular sQ Server Configurations with Avalon2

Number	Arthur Avalon2 Video Processing Card Configurations			
	Avalon A	**Avalon B**	**Avalon C**	**Avalon D**
1	2x Half Duplex SD/HD/3G Channel	2x Half Duplex SD/HD/3G Channel	2x Half Duplex SD/HD/3G Channel	2x Browse Channels
2	2x Half Duplex SD/HD/3G Channel	2x Half Duplex SD/HD/3G Channel	2x Clean output 2x Overlay	2x Browse Channels
3	2x Half Duplex SD/HD/3G Channel	2x Half Duplex SD/HD/3G Channel	2x Half Duplex SD/HD/3G Channel	2x Clean output 2x Overlay
4	2x Half Duplex SD/HD/3G Channel	2x Half Duplex SD/HD/3G Channel	2x Clean output 2x Overlay	2x Clean output 2x Overlay
5	2x Half Duplex SD/HD Channel + 1 Browse	2x Half Duplex SD/HD Channel + 1 Browse	2x Half Duplex SD/HD Channel + 1 Browse	2x Clean output 2x Overlay
6	2x Half Duplex SD/HD Channel + 1 Browse	2x Half Duplex SD/HD Channel + 1 Browse	2x Half Duplex SD/HD Channel + 1 Browse	2x Half Duplex SD/HD Channel + 1 Browse
7	2x Half Duplex SD/HD Channel + 1 Browse	2x Half Duplex SD/HD Channel + 1 Browse	2x Clean output 2x Overlay	2x Clean output 2x Overlay
8	2x Half Duplex SD/HD Channel + 1 Browse	2x Half Duplex SD/HD Channel + 1 Browse	4x Output Channels	4x Output Channels
9	2x Half Duplex SD/HD Channel + 1 Browse	2x Half Duplex SD/HD Channel + 1 Browse	4x Input Channels	4x Input Channels
10	2x Half Duplex SD/HD Channel + 1 Browse	2x Half Duplex SD/HD Channel + 1 Browse	4x Input Channels	4x Output Channels
11	2x Clean + Overlay	2x Clean + Overlay	4x Input Channels	2x Half Duplex SD/HD Channel + 1 Browse
12	2x Clean + Overlay	4x Input Channels	4x Input Channels	2x Half Duplex SD/HD Channel + 1 Browse

3 Connecting the LiveTouch Components

Overview

A standard LiveTouch system comprises the following components:

- LiveTouch Panel
- LiveTouch Desktop Client PC
- LiveTouch Server (sQ1000 Series)
- LiveTouch ISA Managers (Optionally Redundant Pair)
  - LiveTouch Manager (Virtual Machines, Redundant Pair)
  - Web Bin

The rear panel connectors for the LiveTouch Server, Desktop Client and Panel are described in the following sections.

LiveTouch Server Connectors

Note: The following illustrations of the LiveTouch Server rear panels are for information only; the labels used for the I/O ports change according to the configuration of interface cards installed.

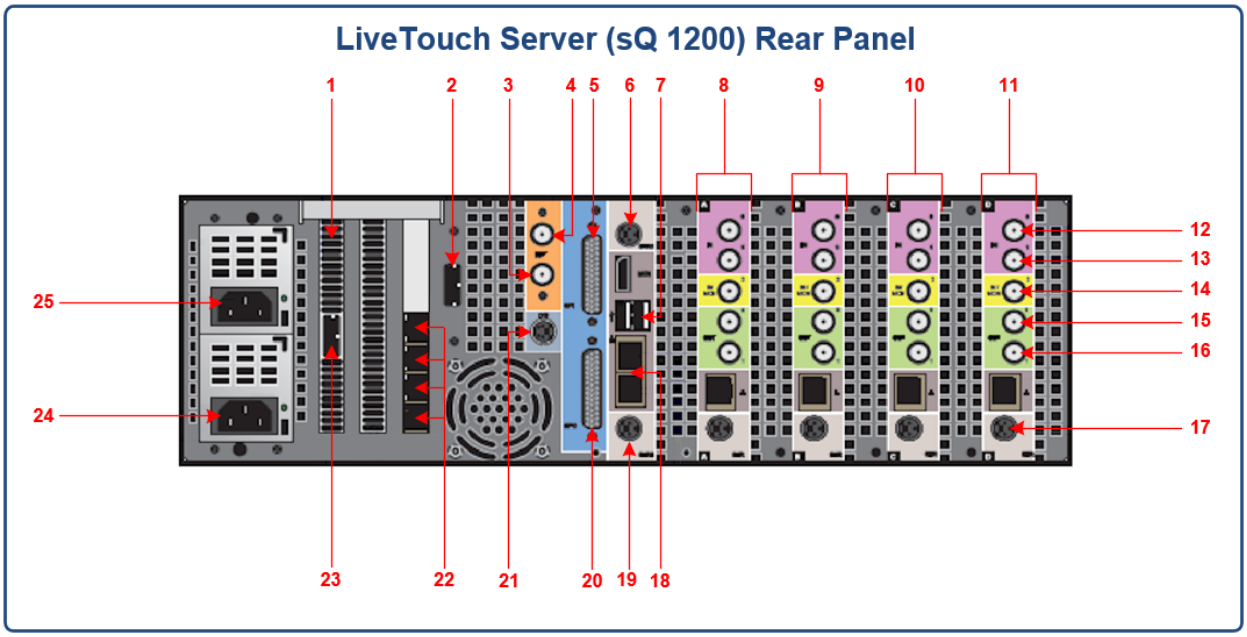


Fig. 3-1: LiveTouch Server Rear Panel Components (sQ 1200)

Key to rear panel items shown in Figure 3-1:

Item	Description
LiveTouch Desktop Client PC Connectors	
1	RAID controller (Lancelot)
2	Serial Attached SCSI - SAS-B connector
3	Video reference OUT - analog reference output
4	Video reference IN - analog reference input
5	GP signal input connector (currently unused)
6	CPU diagnostics serial terminal (Excalibur)
7	USB ports (2)
8	Video processing card (Avalon A)
9	Video processing card (Avalon B)
10	Video processing card (Avalon C)

Item	Description
11	Video processing card (Avalon D)
12	3G SDI In 0 connector
13	3G SDI In 1 connector
14	AUX connector
15	3G SDI Out 0 connector
16	3G SDI Out 1 connector
17	Video I/O Diagnostics serial terminal
18	CPU Ethernet network ports
19	Diagnostic serial terminal
20	GP signal output connector
21	Linear timecode (LTC) connector
22	Clipnet Network Adapter 1 (Quad 1G Shown)
23	Serial Attached SCSI SAS-A connector
24	Power connector for power supply unit #2
25	Power connector for power supply unit #1

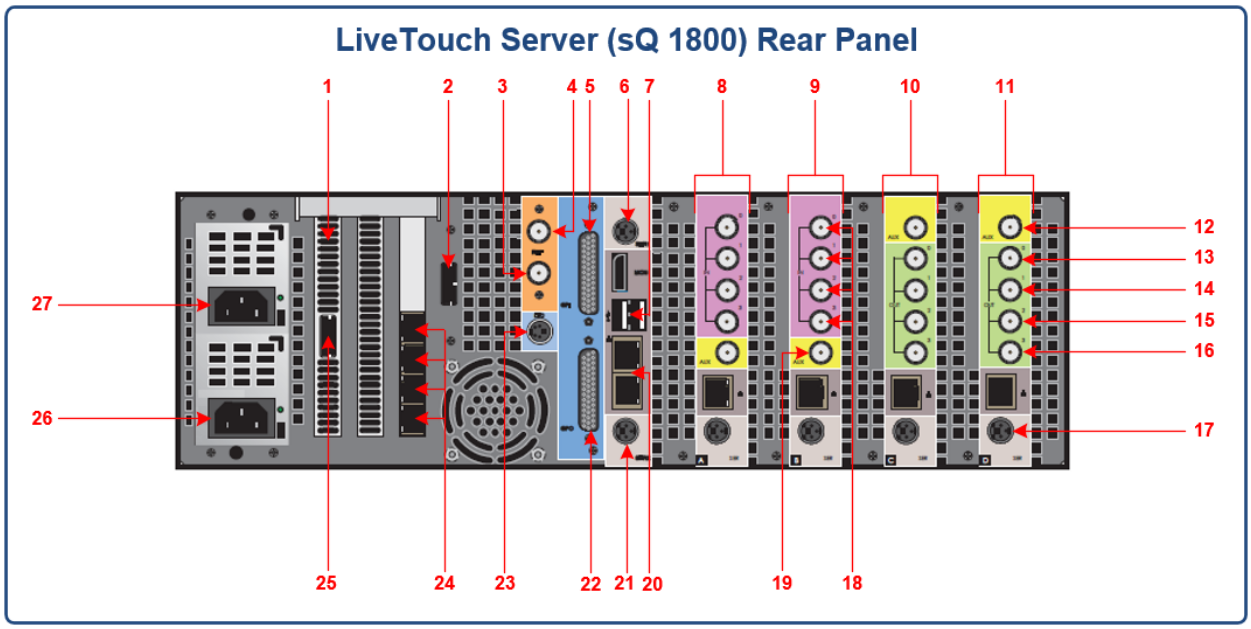


Fig. 3-2: LiveTouch Server Rear Panel Components (sQ 1800)

Key to rear panel items shown in Figure 3-2:

Item	Description
LiveTouch Desktop Client PC Connectors	
1	RAID controller (Lancelot)
2	Serial Attached SCSI SAS-B connector
3	Video reference OUT - analog reference output
4	Video reference IN - analog reference input
5	GP signal input connector
6	CPU diagnostics serial terminal (Excalibur)
7	USB ports (2)
8	Video processing card (Avalon A)
9	Video processing card (Avalon B)
10	Video processing card (Avalon C)
11	Video processing card (Avalon D)
12	AUX connector
13	3G SDI Out 0 connector (dependent on unit configuration)
14	3G SDI Out 1 connector (dependent on unit configuration)
15	3G SDI Out 2 connector (dependent on unit configuration)
16	3G SDI Out 3 connector (dependent on unit configuration)
17	Video I/O Diagnostics serial terminal
18	3G SDI In connector 0 3G SDI In connector 1 3G SDI In connector 2 3G SDI In connector 3
19	AUX connector
20	CPU Ethernet network ports
21	Diagnostic serial terminal
22	GP signal output connector
23	Linear timecode (LTC) connector
24	Clipnet Network Adapter 1
25	Serial Attached SCSI SAS-A connector
26	Power connector for power supply unit #2
27	Power connector for power supply unit #1

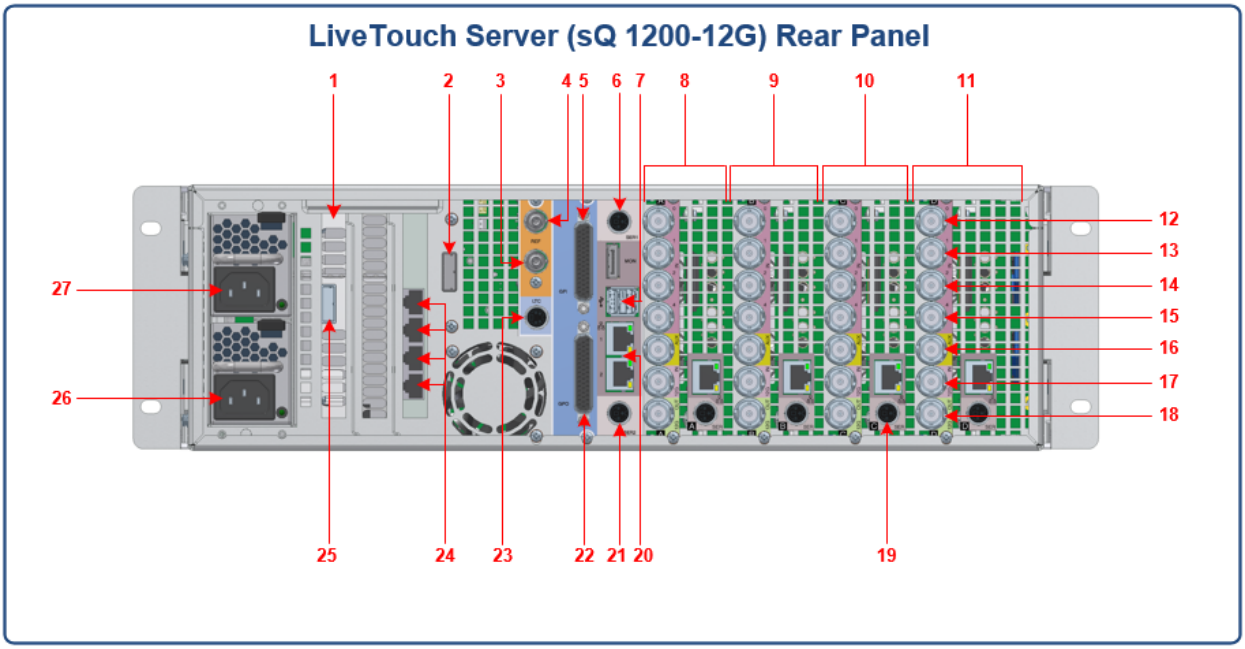


Fig. 3-3: LiveTouch Server Rear Panel Components (sQ 1200 -12G)

Key to rear panel items shown in Figure 3-3:

Item	Description
LiveTouch Desktop Client PC Connectors	
1	RAID controller (Lancelot)
2	Serial Attached SCSI SAS-B connector
3	Video reference OUT - analog reference output
4	Video reference IN - analog reference input
5	GP signal input connector (Not active)
6	CPU diagnostics serial terminal (Excalibur)
7	USB ports (2)
8	Video processing card (Avalon A)
9	Video processing card (Avalon B)
10	Video processing card (Avalon C)
11	Video processing card (Avalon D)
12	3G SDI In connector 0
13	3G SDI In connector 1
14	3G SDI In connector 2

Item	Description
15	3G SDI In connector 3
16	AUX connector
17	12G SDI In connector
18	12G SDI Out connector
19	Video I/O Diagnostics serial terminal
20	CPU Ethernet network ports
21	Diagnostic serial terminal
22	GP signal output connector
23	Linear timecode (LTC) connector
24	Clipnet Network Adapter 1
25	Serial Attached SCSI SAS-A connector
26	Power connector for power supply unit #2
27	Power connector for power supply unit #1

Connecting the LiveTouch Server

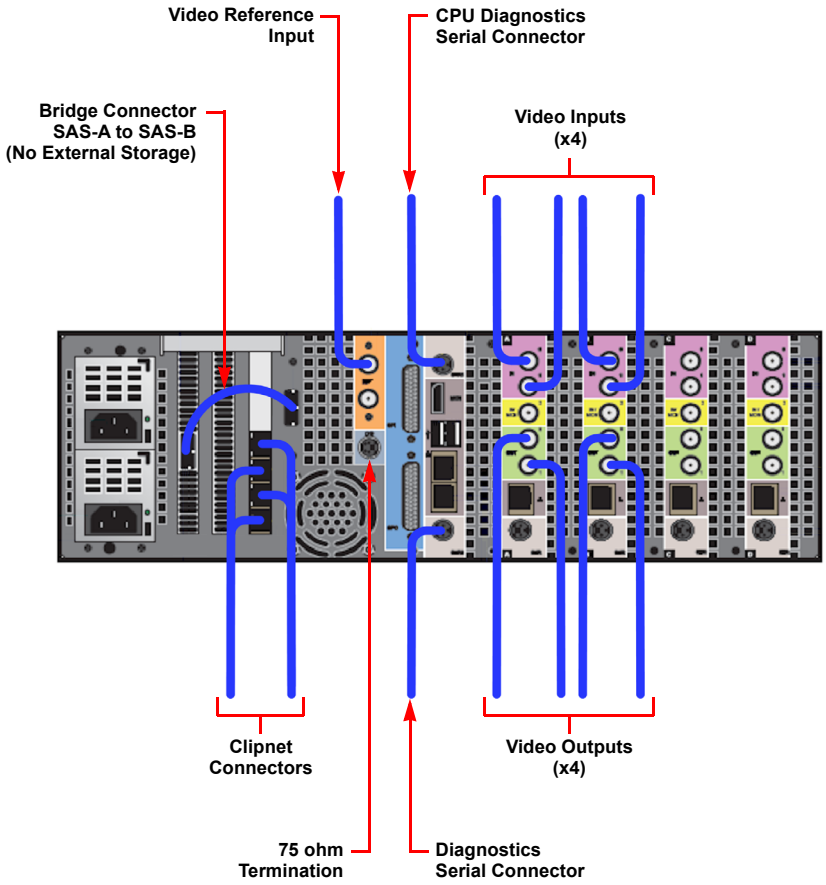


Fig. 3-4: LiveTouch Server Connections (Dependent on Unit Configuration)

Connect up the LiveTouch Server as follows:

1 Connect the bridging SAS cable between SAS-A Connector and SAS-B Connector to use the internal storage of the LiveTouch Server.

2 Connect the server side of the Clipnet network cable to the Clipnet network adapter.

3 Connect the other end of the Clipnet network cable to the network Gb Switch.

The Clipnet network cable is as follows:

Option	Description	Details
Quad Gigabit	Copper interface with RJ45 connections	**1000 BASE-T** • Network carrier: 1000 BASE-T Gigabit Ethernet • Connector type: RJ45 • Cable type: CAT 5E • Maximum expected operating distance: 100m (if patch panels are used, this will reduce) • Communication protocols: TCP/IP & UDP/IP
Dual Ten Gigabit – Copper	Copper interface with RJ45 connections	**10G BASE-T** • Network carrier: 10G BASE-T • Connector type: RJ45 • Cable type: CAT 6A • Maximum expected operating distance: 100 m (if patch panels are used, this will reduce) • Communication protocols: TCP/IP & UDP/IP
Dual Ten Gigabit – Optical	Optical interface with SFP LC connections	**10G BASE-SR** • Network carrier: 10G BASE-SR • Connector type: LC • Cable type: 50/125 µm or 62.5/125 µm fiber • Maximum expected operating distance: Up to 300m dependent on type • Communication protocols: TCP/IP & UDP/IP

Other Clipnet network cables are optionally available.

4 Connect the 1 GbE (RJ45) connector of the Ethernet cable between the top Ethernet port and the network Gb Switch.

This enables the ISA to communicate with the LiveTouch Server, and allows control of the LiveTouch Server by the ISA Manager.

5 If required, connect the system reference input connector to the reference input defined on the Server Status Summary webpage in the section Reference & System Timecode.

Note: The reference input is used for SDI video output timing. The reference input/output BNC connectors are unterminated. Terminate the Reference OUT connector with a 75 ohm BNC termination, unless looped-through to a second LiveTouch Server - the last device should always be terminated.

6 Connect the two serial ports for monitoring the LiveTouch server interface cards as follows:

- Connect the upper serial input connector to monitor the status of the CPU.

- Connect the switchable lower serial output port to output status information from all other cards; set to **Combined** (for all ports) in the **Serial Ports** section of the **System Configuration** webpage on the server.

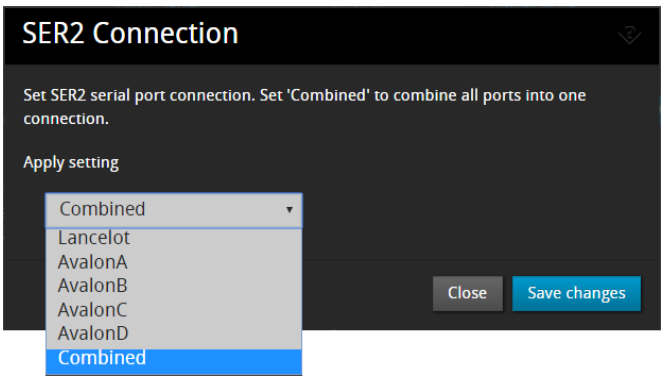


Fig. 3-5: Diagnostic Serial Output Port - Set to Combined for All Ports

7 Connect the video cables to the BNC connectors of the video processing cards.

Your connections will depend on the requirements and configuration of your system.

8 If required, connect the supplied Linear Timecode (LTC) cable between the LTC connector and the house timecode.

The LTC input allows a timecode signal to be read by the LiveTouch Server and used as the system timecode as an alternative to the system reference VITC.

An LTC XLR cable (2136-51-013) of length 1 m, is supplied, see Figure 3-6.

Note: It is recommended to lock the LTC to the same house reference signal as the Server.

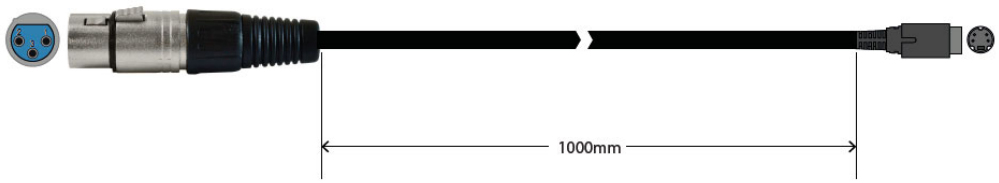


Fig. 3-6: LTC Cable

9 Connect the power cables between the PSU sockets and the power sources mounted in the rack as described in Chapter 5 *Power Supplies*.

LiveTouch Server Storage

Each sQ Server has one Enterprise sQ RAID controller card and one or more disk enclosures using Serial Attached SCSI (SAS) technology; together this system is referred to as sQ SAS.

The sQ 1200 can use either hard disks (HDs) or solid state drives (SSDs), whereas the sQ 1800 uses HDs only.

sQ 1200 Video Server

An sQ 1200 LiveTouch server features internal storage of one RAID3 array with eight disk drives including one parity disk.

sQ 1800 Video Server

An sQ 1800 LiveTouch server features external storage of three RAID3 arrays, each with eight disk drives with one parity disk per RAID.

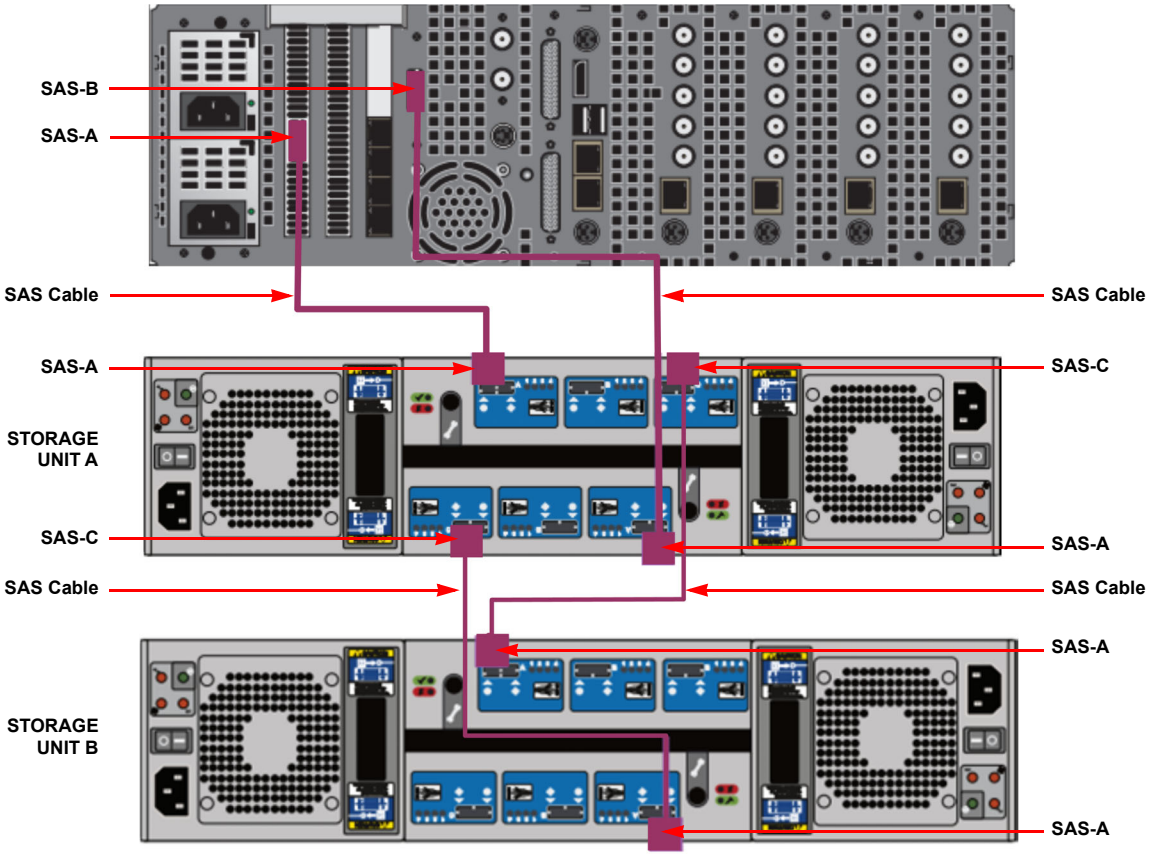


Fig. 3-7: sQ 1800 Connecting External Storage Using SFF SAS Cables

Connecting External Storage to an sQ 1800 LiveTouch Video Server

To connect additional storage modules to an sQ1800 LiveTouch Server using small form factor (SFF) SAS cables as follows:

1 Remove the bridge cable between ports SAS-A and SAS-B on the rear panel of the sQ 1800 Video Server, see Figure 3-4 on page 35.

2 Connect LiveTouch server port SAS-A to port SAS-A (top) on the first additional storage unit.

3 Connect LiveTouch server port SAS-B to port SAS-A (bottom) on the first additional storage unit.
4 For a second storage unit:
   a Connect port SAS-C (bottom) on unit 1 to port SAS-A (bottom) on unit 2.
   b Connect port SAS-C (top) on unit 1 to port SAS-A (top) on unit 2.

LiveTouch Server Interface Cards

Interface cards used in the LiveTouch server are identified using the following codes:

- **LA0** - Lancelot
- **AVA** - Avalon A
- **AVB** - Avalon B
- **AVC** - Avalon C
- **AVD** - Avalon D
- **CN0** - Clipnet
- **CN1** - Clipnet
- **CN2** - Clipnet
- **CN3** - Clipnet

Starting the LiveTouch Server

Start-up the LiveTouch Server as follows:

1 Once connected to the power source, switch on the LiveTouch server using the on/off switch inside the front panel.

When powered on, the LiveTouch server should take about one minute to boot-up. You should hear a slow, regular beep during start-up, as long as no errors are encountered. An increasing beep rate might indicate a potential problem and should be investigated.

2 When fully booted, open the LiveTouch server web page using the address:

http://<*IP_address_of_LiveTouch_Server_CPU*>

For example: **http://10.165.35.64**

If required, load software either from the web page or directly using one of the USB ports.

3 Select: **Status > Summary**

This opens the **Status Summary** screen for the LiveTouch server, see Figure 3-8. Use this screen to check the status of the following:

- Control Network
- Clipnet
- SDI channels

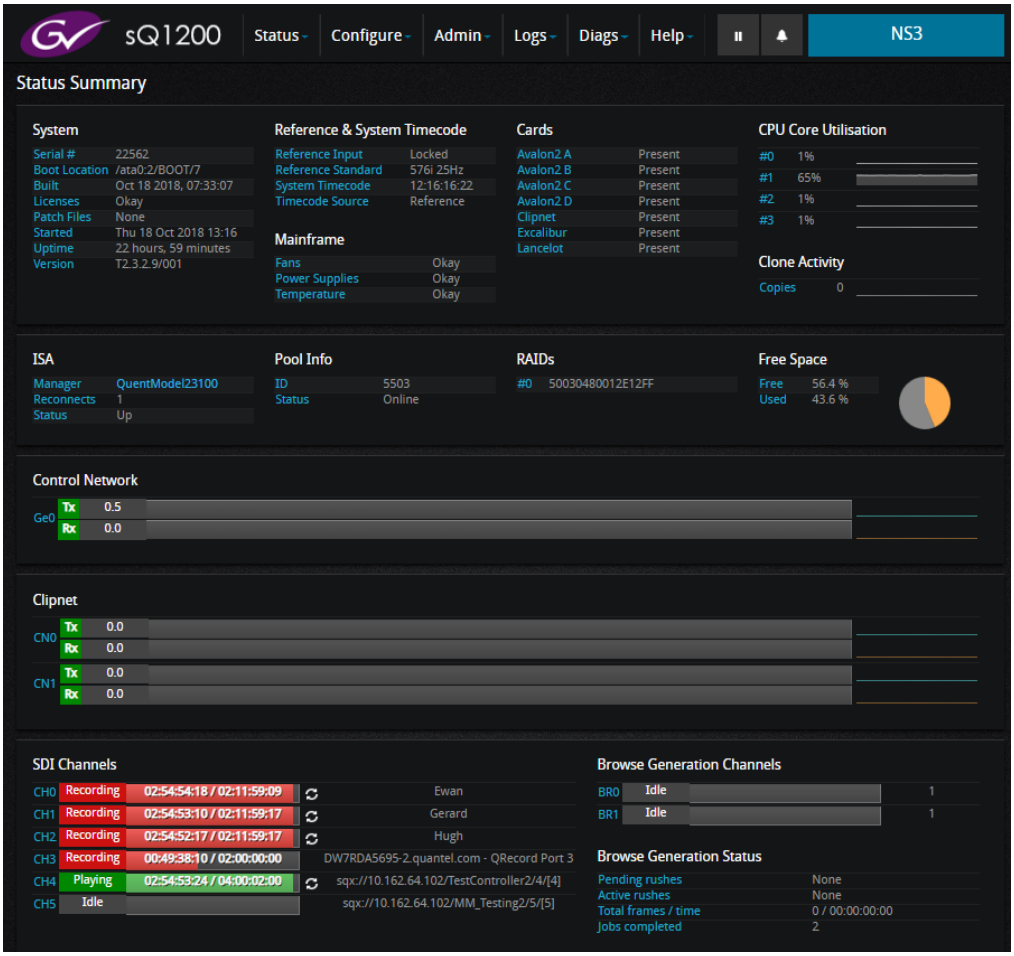


Fig. 3-8: LiveTouch Server Status Summary

4 Select: **Configure > System**

Use this **System Configuration** screen to check the status of the following:

- Network Port
- Reference Settings
- CPU Clock and Clock Sync Settings

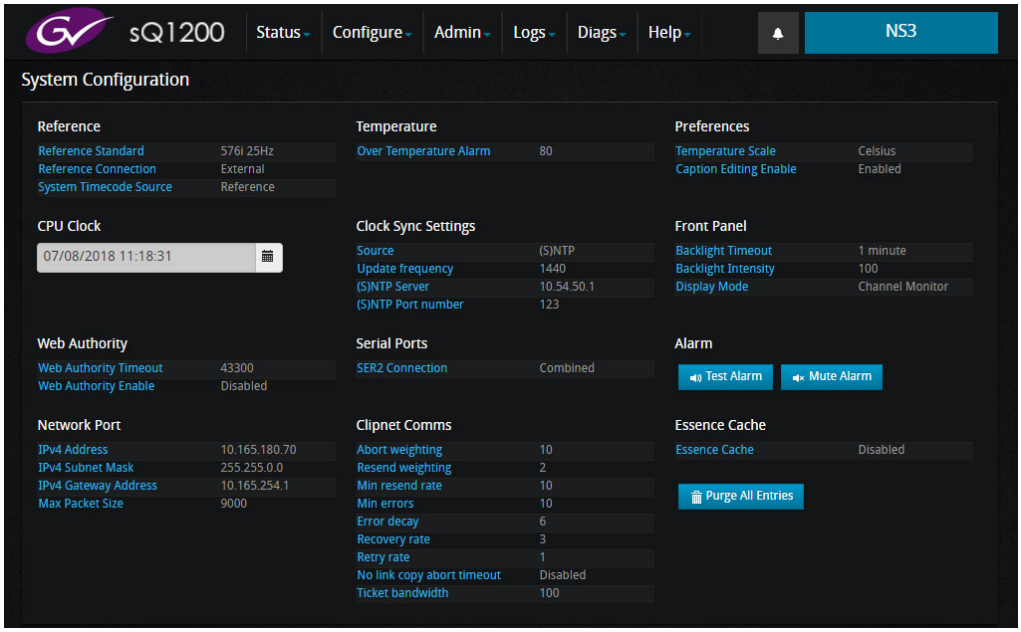


Fig. 3-9: LiveTouch Server System Configuration

5 Confirm that all correct software licenses are installed, by selecting: **Admin > Licenses**
This opens the Licenses screen, see Figure 3-10.

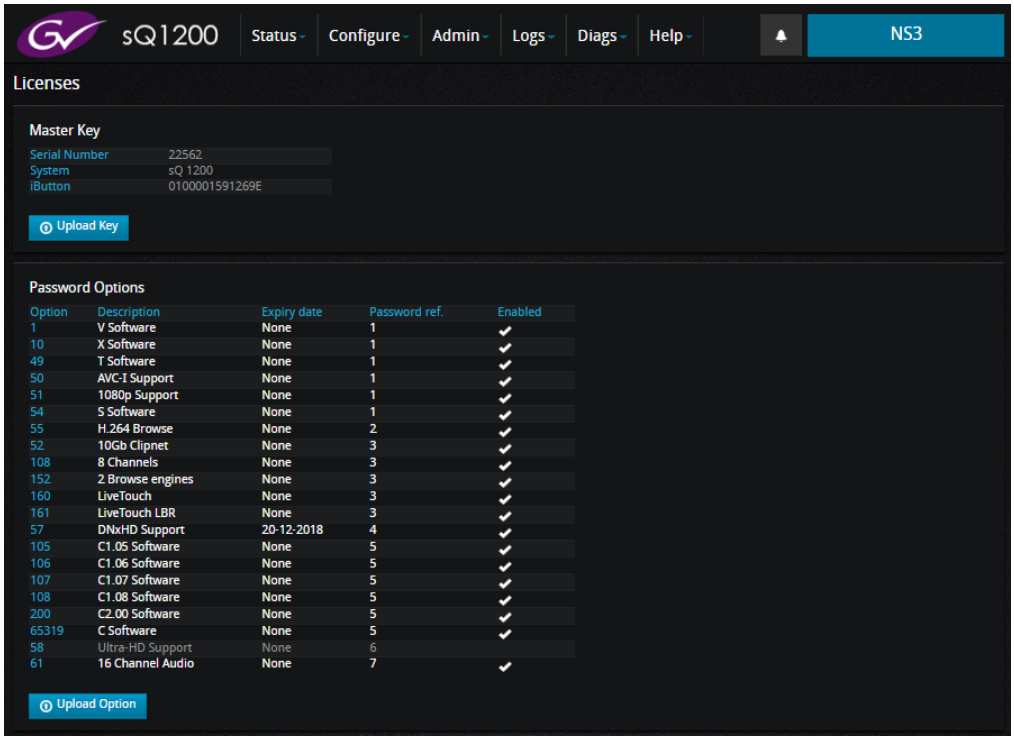


Fig. 3-10: LiveTouch System Licenses (For Information Only)

Setting the LiveTouch Server IP Addresses

The IP address of the server is usually set before shipping, however, if necessary, you can modify the IP address for the LiveTouch Server CPU from the server **System Configuration** web page (see Figure 3-9 on page 42) as follows:

> **Note:** The IP address for the LiveTouch Server CPU must be set before you can access the Server web pages.

1 Click **IPv4 Address** to open the following **IPv4 Address** dialog:

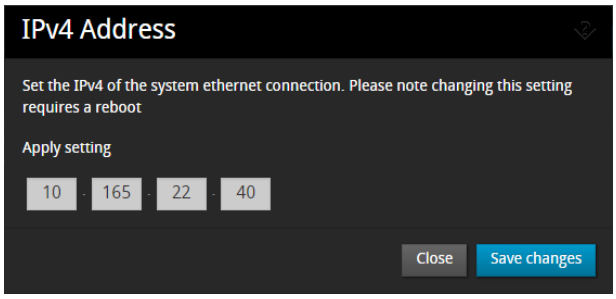
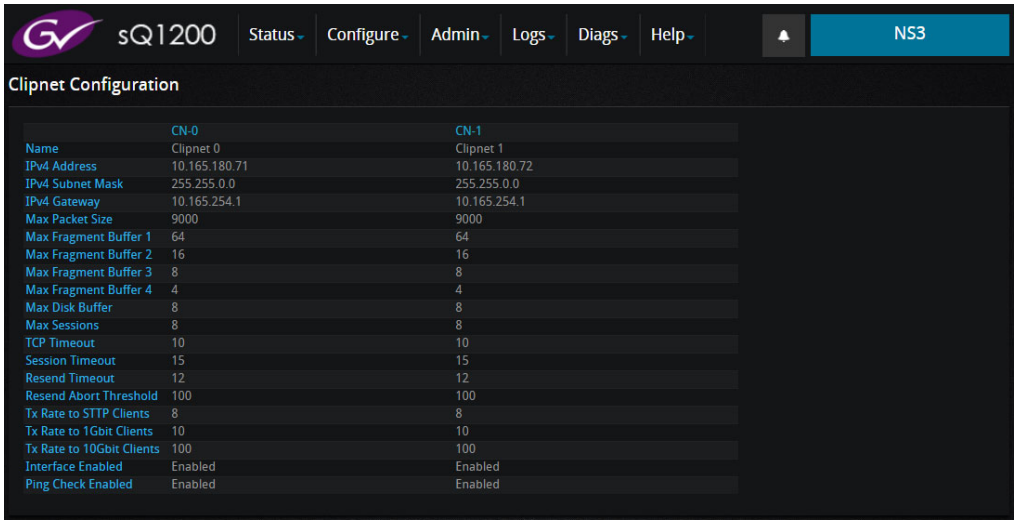


Fig. 3-11: LiveTouch Server System Configuration - Setting the IP Address

2 Enter the IP address for the LiveTouch Server Ethernet connection then click **Save changes** and reboot the server.

3 Set the IP address for the server's Clipnet interface by selecting: **Configure > Clipnet**

This opens the **Clipnet Configuration** screen, see Figure 3-12.



	CN-0	CN-1
Name	Clipnet 0	Clipnet 1
IPv4 Address	10.165.180.71	10.165.180.72
IPv4 Subnet Mask	255.255.0.0	255.255.0.0
IPv4 Gateway	10.165.254.1	10.165.254.1
Max Packet Size	9000	9000
Max Fragment Buffer 1	64	64
Max Fragment Buffer 2	16	16
Max Fragment Buffer 3	8	8
Max Fragment Buffer 4	4	4
Max Disk Buffer	8	8
Max Sessions	8	8
TCP Timeout	10	10
Session Timeout	15	15
Resend Timeout	12	12
Resend Abort Threshold	100	100
Tx Rate to STTP Clients	8	8
Tx Rate to 1Gbit Clients	10	10
Tx Rate to 10Gbit Clients	100	100
Interface Enabled	Enabled	Enabled
Ping Check Enabled	Enabled	Enabled

Fig. 3-12: LiveTouch Server System Configuration - Clipnet Configuration

4 Click the IP Address of the Clipnet interface you want to configure.

This opens the **IPv4 Address** dialog:

Fig. 3-13: Setting the IP address of the Clipnet Interface

5 Enter the IP address for the appropriate Clipnet interface then click **Save changes**.

6 Check the configuration of the interface between the LiveTouch Server and ISA, by selecting: **Configure > Quentin ISA Interface**

This opens the Quentin ISA Configuration dialog, see Figure 3-14.

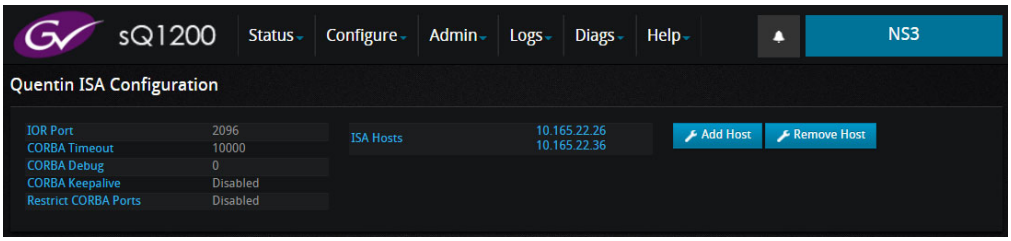


Fig. 3-14: LiveTouch Quentin ISA Configuration Screen

7 To add the IP addresses for a Slave ISA, click **Add Host**.

This opens the **Add IOR Host** dialog box, see Figure 3-15.

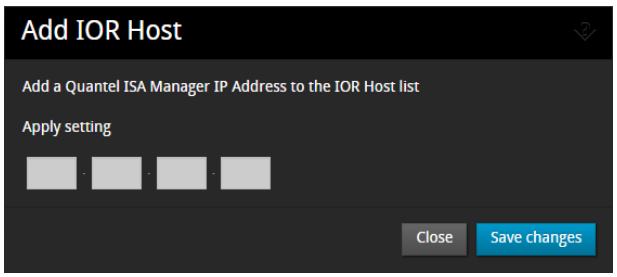


Fig. 3-15: LiveTouch ISA Configuration Screen

8 Enter the target IP addresses for the Slave ISA, then click **Save Changes**.

9 Click **Add Host** to open the **Add IOR Host** dialog box again.

10 You are now ready to run the ISA Manager setup program, see Installing the ISA Manager Software, on page 64.

LiveTouch Panel and Desktop Client Connectors

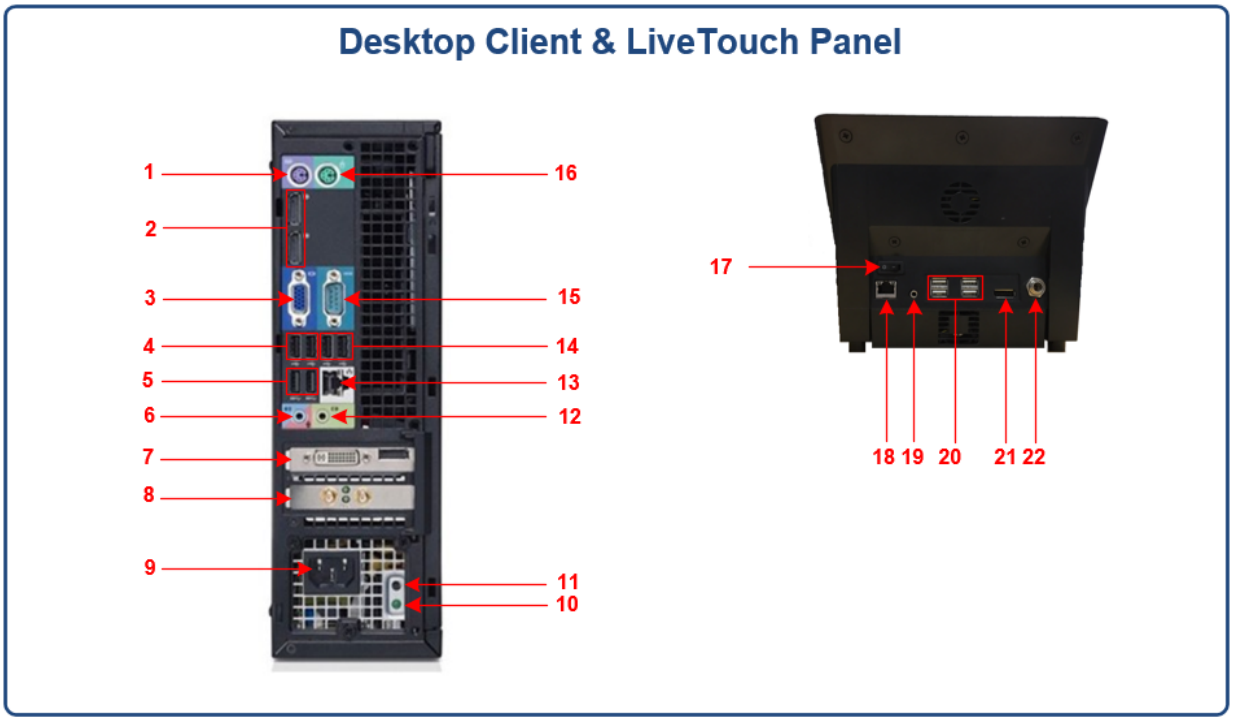


Fig. 3-16: LiveTouch Desktop Client and Panel Rear Connectors, Switches and LEDs

Key to rear panel items shown in Figure 3-16:

Item	Description
LiveTouch Desktop Client PC Connectors	
1	Mouse connector
2	HDMI display port connectors (2)
3	VGA connector
4	USB 3.0 connectors (2)
5	USB 2.0 connectors (2)
6	Line-in / microphone connector
7	Expansion card slot (optional)
8	Expansion card slot (optional)
9	Power connector
10	Power supply diagnostic LED
11	Power supply diagnostic button
12	Line-out connector

Item	Description
13	Ethernet network connector (including network-link integrity LED and network activity LED)
14	USB 2.0 connectors (2)
15	Serial connector
16	Keyboard connector
LiveTouch Panel Connectors	
17	LiveTouch Panel on/off switch
18	Ethernet network connector
19	Audio / line-out connector
20	USB 2.0 connectors (4)
21	HDMI display port connector
22	Power connector

LiveTouch Desktop Client PC Connections

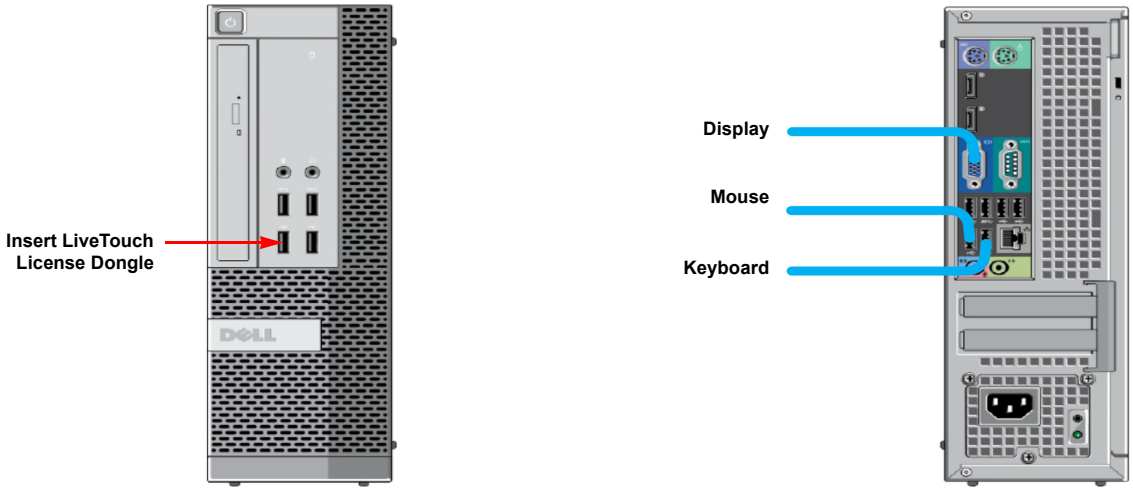


Fig. 3-17: Other LiveTouch Desktop Client PC Connections

LiveTouch ISA Connectors

The ISA includes the following components:

- Two power supplies
- Two RAID drives
- Two SAS disk drives running the Virtual Machines (VMs) for the LiveTouch Manager and Search (Web Bin)

The ISA database is used to track the caching of clips by storing the clip metadata instead of the media files themselves. An optional ISA slave may also be included to provide redundancy.

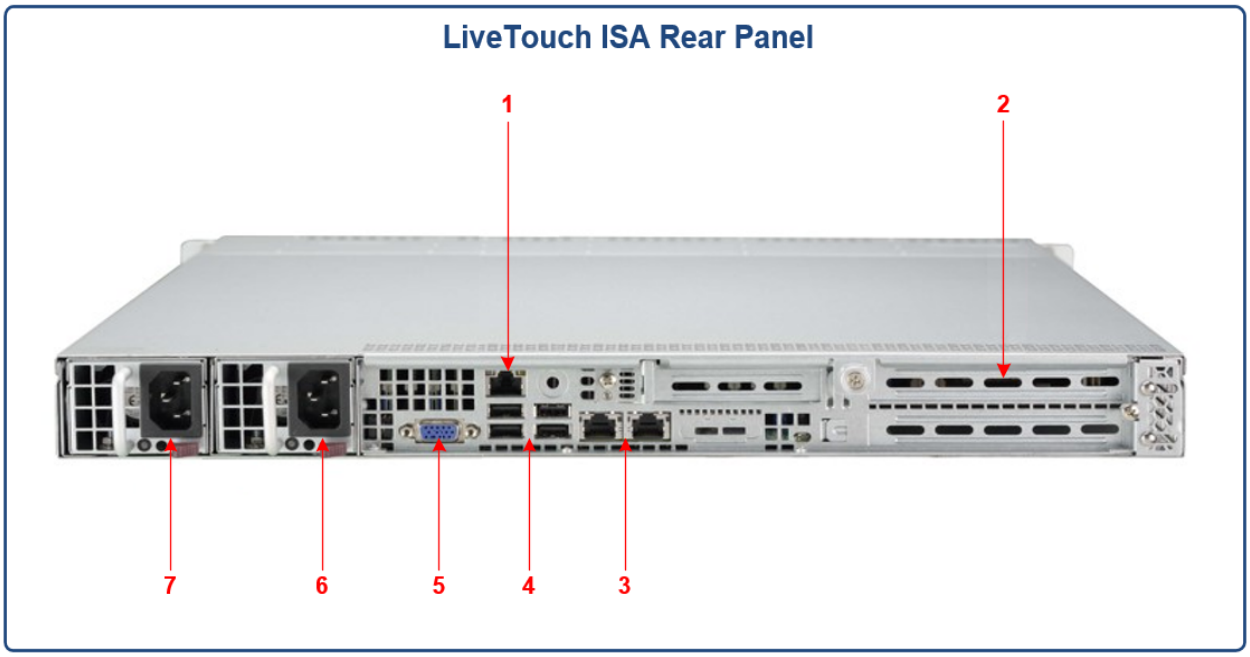


Fig. 3-18: LiveTouch ISA Rear Panel Connectors

Key to rear panel items shown in Figure 3-18:

Item	Description
1	Dedicated Intelligent Platform Management Interface (IPMI) LAN port
2	2 PCI-E 3.0 x 16 expansion slots
3	2 RJ45 10 Gigabit Ethernet (10GbE) LAN ports
4	USB 3.0 connectors (4)
5	VGA connector
6	700 / 750 W power connector for power supply #1
7	700 / 750 W power connector for power supply #2

LiveTouch ISA Connections

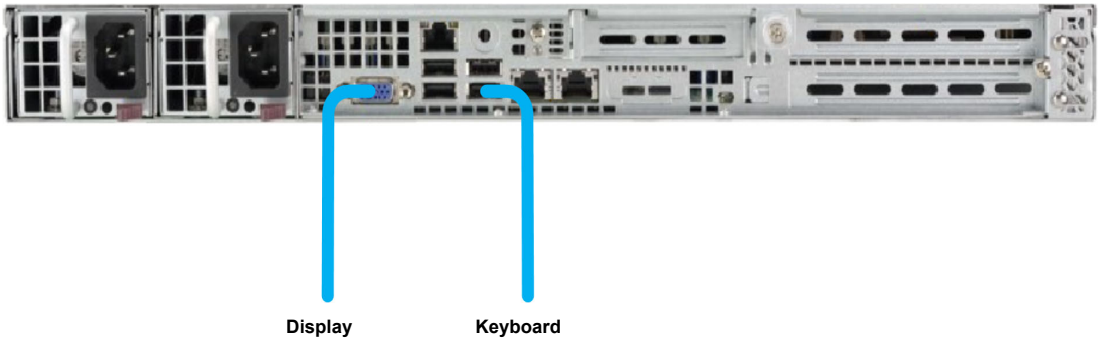


Fig. 3-19: Other LiveTouch ISA Connections

LiveTouch System Cabling

Ethernet Network Cabling

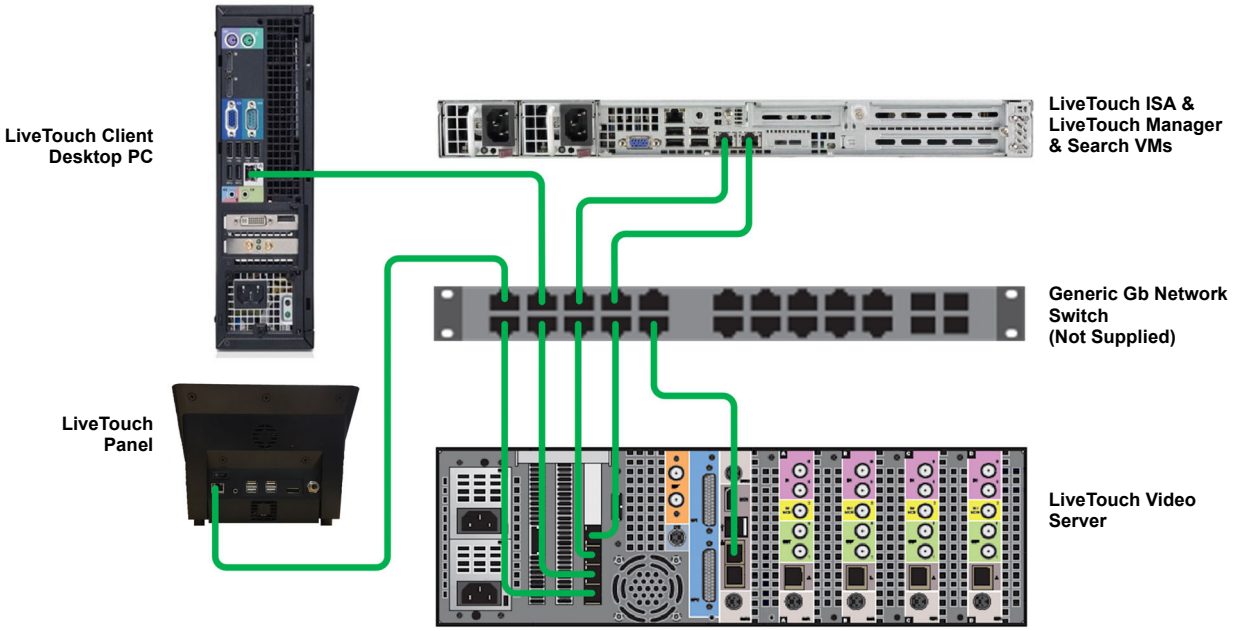


Fig. 3-20: LiveTouch Network Connections

Power Cabling

For details of connecting to the power source, see Chapter 3 on page 55.

4 Environment and Location

Environmental Considerations

This chapter describes how to install the rack-mounted equipment into the 19 inch rack environment and LiveTouch desktop client PC and Panel in the desktop environment. Attention should be paid to the cooling information for the LiveTouch server.

The ambient temperature for all the supplied equipment should not exceed the limits of 5 and 30°C (41 to 86°F) at a relative humidity of 10 to 90% (non-condensing).

Installing the equipment in a clean environment with moderate temperature and humidity will promote a long and trouble-free equipment life.

Rack-mounting Considerations

To prevent physical injury when mounting or servicing the LiveTouch Server and ISA units in a rack, you must take special precautions to ensure that the system remains stable.

The following guidelines are provided for your safety:

- Mount units from the lower part of the rack if these are the only components in the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.
- Mount equipment so that uneven mechanical loading causing hazardous conditions does not arise.

Mounting the Video Server and ISA(s) into a 19 inch Rack

The Video Server and ISA or ISAs can be mounted into a standard 19 inch rack on the supplied rails.

1 Check that there is enough clearance for all connectors.
2 Fasten the video server to the rack system using 4 x M6 (1/4 inch) screws (available from rack suppliers).
3 Fasten each ISA (if more than one included) to the rack system using 2 x M6 (1/4 inch) screws (available from rack suppliers).
4 Once the unit is fastened to the rack, insert all connectors making sure that any external PSUs do not hang from the side of the unit; any external PSUs must be supported.

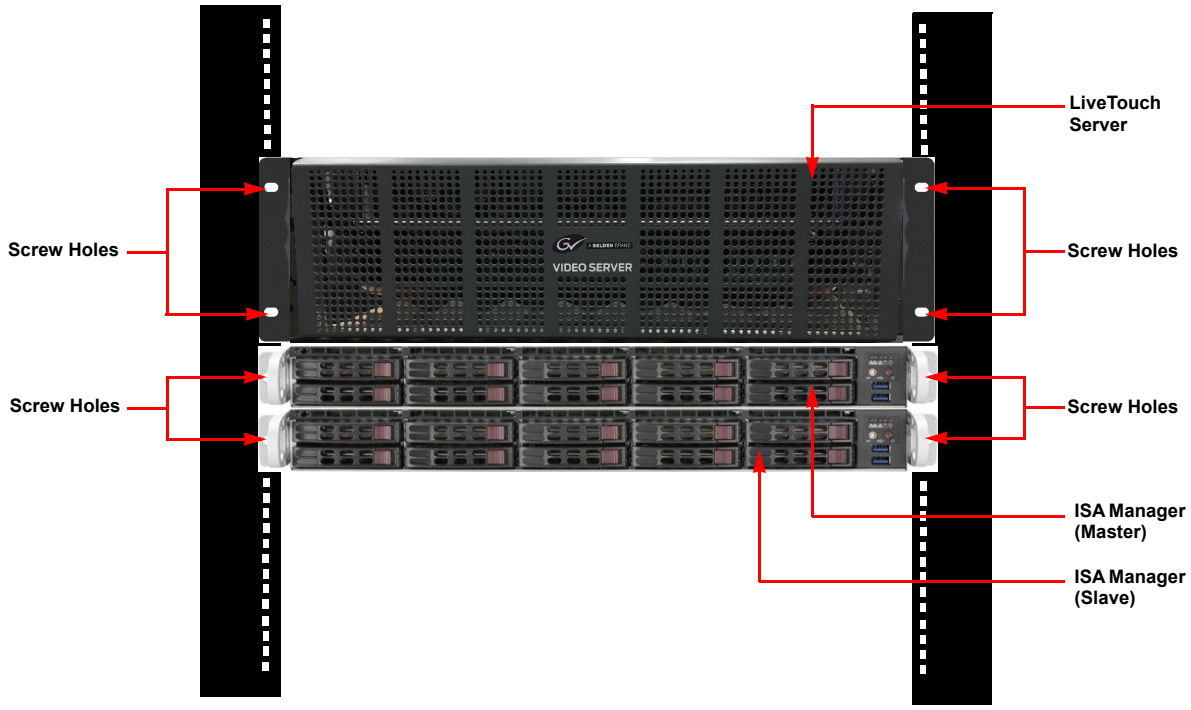


Fig. 4-1: Rack-mounted LiveTouch Server and ISA Managers

Component Cooling

Air Flow through the LiveTouch Server and ISA(s)

The following ventilation precautions should be observed for the rack-mounted LiveTouch Server and ISAs:

1 The air intakes on both sides and the cooling fan exhausts at the rear of the units must not be obstructed - a minimum clearance of 200 mm (8 inches) at the rear of the rack is essential.

2 Air intakes situated at the front and on both sides, are to allow the inflow of cooling air and must not be obstructed.

The ISA chassis incorporates up to six sets of 4 cm counter-rotating fans, located in the middle section. The fans are 1 U high and are powered by 4-pin connectors. The fan speed is controlled by intelligent platform management interface (IPMI) software. The ISA power supply module also includes a cooling fan. The fans in this system are not redundant, hot-plugable.

Airflow Through the Panel

Make sure that the LiveTouch panel is located on a suitable surface where airflow through the panel is not restricted.

A fan is mounted in the rear of the LiveTouch panel, which activates above a configurable fan-trip temperature threshold. In addition, you can configure an over-temperature alarm to alert you to the potential over-heating condition.

For more information on configuring the fan trip temperature and over-temperature alarm threshold, see the *LiveTouch User Guide*.

Airflow through the Desktop Client PC

As for any PC, make sure that the Desktop unit is located on a suitable surface where airflow through the unit is not restricted.

5 Power Supplies

Internal Power Supplies

The information below gives an overview of the power supplies used in the LiveTouch components.

Note: To reduce the risk of electric shock, plug each power supply cord into separate branch circuits employing separate service grounds.

Both the LiveTouch Server and LiveTouch ISA are supplied with two power supplies as standard, one powering the device (Server or ISA) and the other providing redundancy.

Note: To ensure full dual redundancy, the two power supplies must be powered from independent power sources in the cabinet power rails.

This symbol indicates that hazardous voltages are present inside the devices. ***No User Serviceable Parts*** are inside the power supplies. This unit should only be serviced by trained personnel.

Before powering on the LiveTouch Server, make sure that all foam used to protect the device in transit is removed, especially the foam insert inside the front panel.

The power supplies for the LiveTouch Server and ISA are located inside the unit. The power supplies do not have independent on/off switches. The LiveTouch server has an On/Off switch behind the front panel. To access the switch, pull the front cover out and downward so that it hinges away from the unit. The on/off switch is located at the right-hand side of the unit, above the Buzz reset switch.

Each ISA has an on/off switch located at the right-hand side of the front panel.

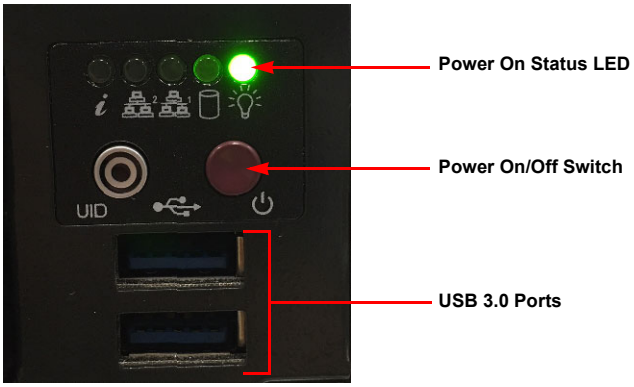


Fig. 5-1: LiveTouch ISA Power On/Off Switch

The LiveTouch Server and ISA(s) will power up when you press the **On/Off** switch after plugging the AC power cables into the IEC connectors and switching **On** at the AC mains supply.

Checking the Power Supplies

Power supplies in the LiveTouch Server are hot-swappable. Replacing power supplies should only be attempted by qualified personnel.

> **Note:** The power on/off switch for the LiveTouch server is located inside the front panel of the server, on he right-hand side of the unit. To access the switch, you will need to open the front panel of the unit.

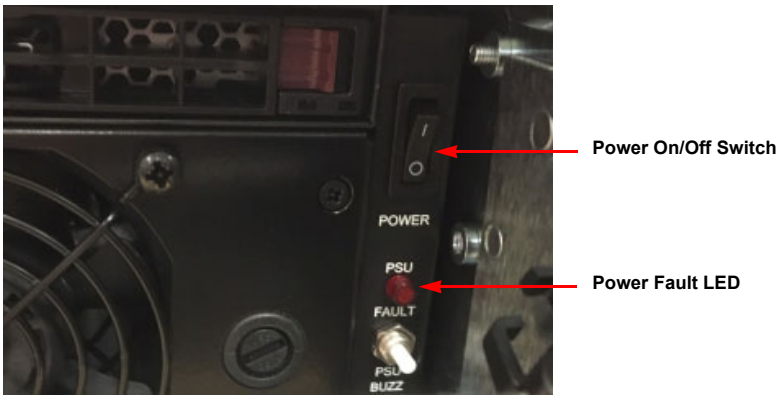


Fig. 5-2: LiveTouch Server Power On/Off Switch Inside Front Panel

To check that the power supplies are working correctly, when mains power is applied, a green power activity LED is lit, as shown in Figure 5-3 on page 56.

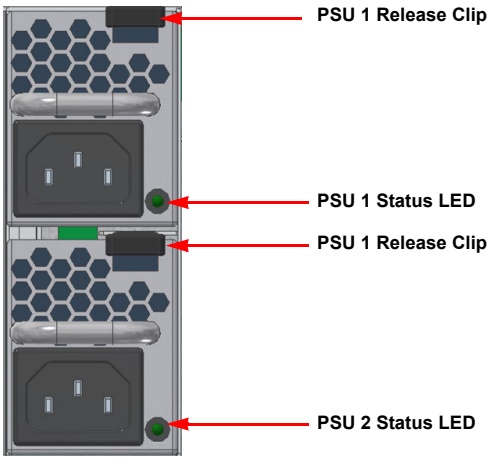


Fig. 5-3: LiveTouch Server Power Supply Status LEDs

The power supply units (PSUs) in the LiveTouch Server are both hot-swapable so can be individually removed from the unit by pressing the release clip (see Figure 5-3) and carefully withdrawing the PSU from the body of the Server.

CAUTION: The Power Supplies have NO user serviceable parts inside and if one should become faulty, it should be replaced immediately.

Note: Do not allow the power supplies to hang freely from the LiveTouch Server or ISA. Make sure that the cables are not under any stress.

External Power Supplies for Other LiveTouch Components

The LiveTouch Panel is supplied with one external 12 V AC adapter power supply connected by way of a screw jack connector.

Fig. 5-4: LiveTouch Panel 12 V AC Adapter

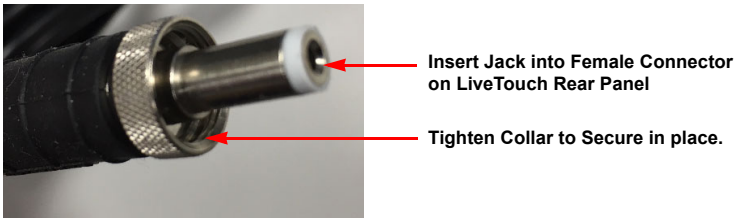


Fig. 5-5: LiveTouch Panel 12 V AC Adapter Connector Showing Screw Collar

The LiveTouch Client Desktop PC and Display are each supplied with a standard AC power cable.

CAUTION: The Power Supplies have NO user serviceable parts inside and are sealed shut. Do not attempt to open the power supply cases.

Note: Make sure that the mains power is turned OFF before connecting the PSU to the Panel.

The power supply connector plug that connects to the control surface is a jack-type fitted with a screw collar, which should be tightened to secure the connector in place. Care should be taken when connecting and disconnecting power to the LiveTouch Panel.

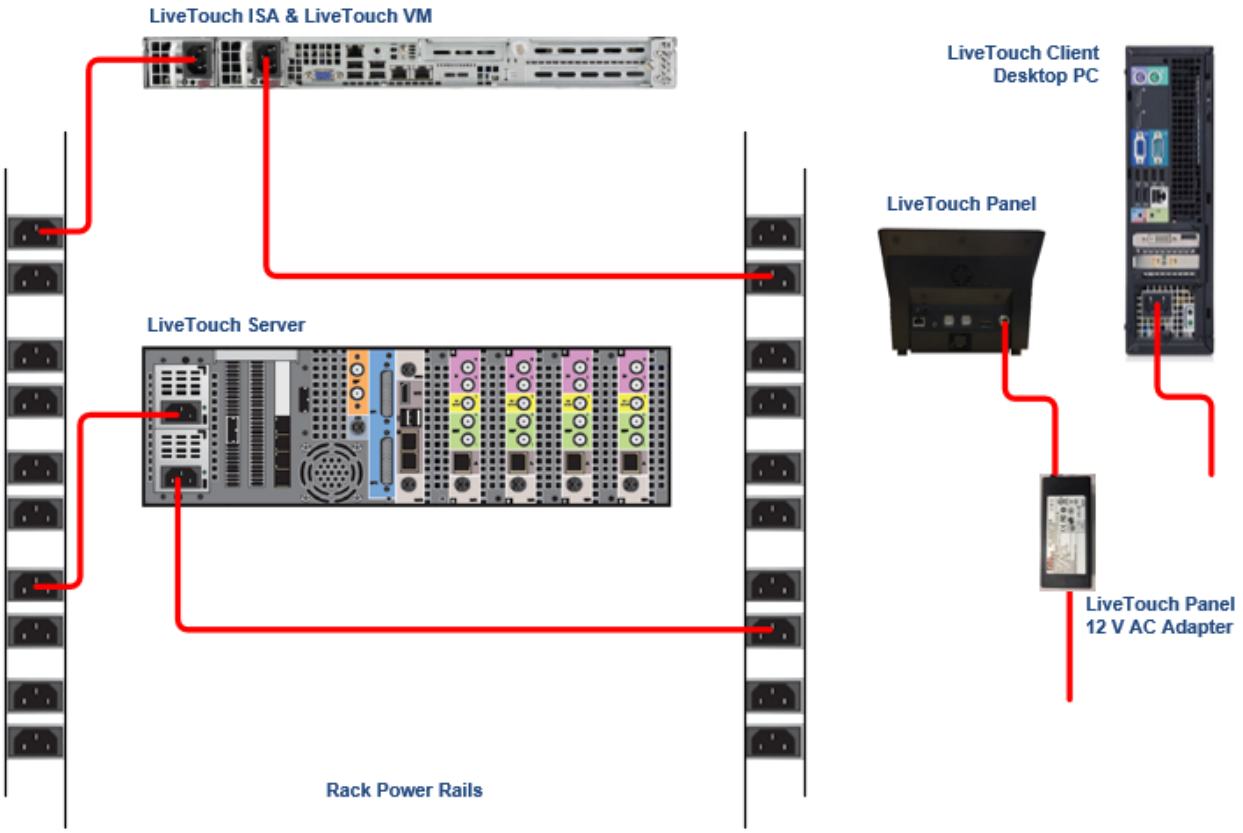


Fig. 5-6: LiveTouch Power Connections

6 Software Installation and Configuration

Overview

> **Note:** All LiveTouch systems are shipped with all required software installed, configured and tested. Information on installing the various software components is provided in this guide for use in the rare cases that a re-installation may be required.

LiveTouch version 1.10 supports the following software components at the indicated versions and higher:

Component	Minimum Software Version
LiveTouch Desktop Client	V7.1.3
LiveTouch Panel	V7.1.0
LiveTouch Manager	V1.10.1
LiveTouch Web Bin	V1.10
LiveTouch ISA	V5.4.2.4
LiveTouch Server (sQ1000 Series Server)	V2.3.3
Associated Seat Code (Qube and sQEdit Only)	V6.7.11
Fileflow Engine (Optional)	V6.7.13
Fileflow Manager (Optional)	V3.2.0 (Supports 1.5.4 or later.)

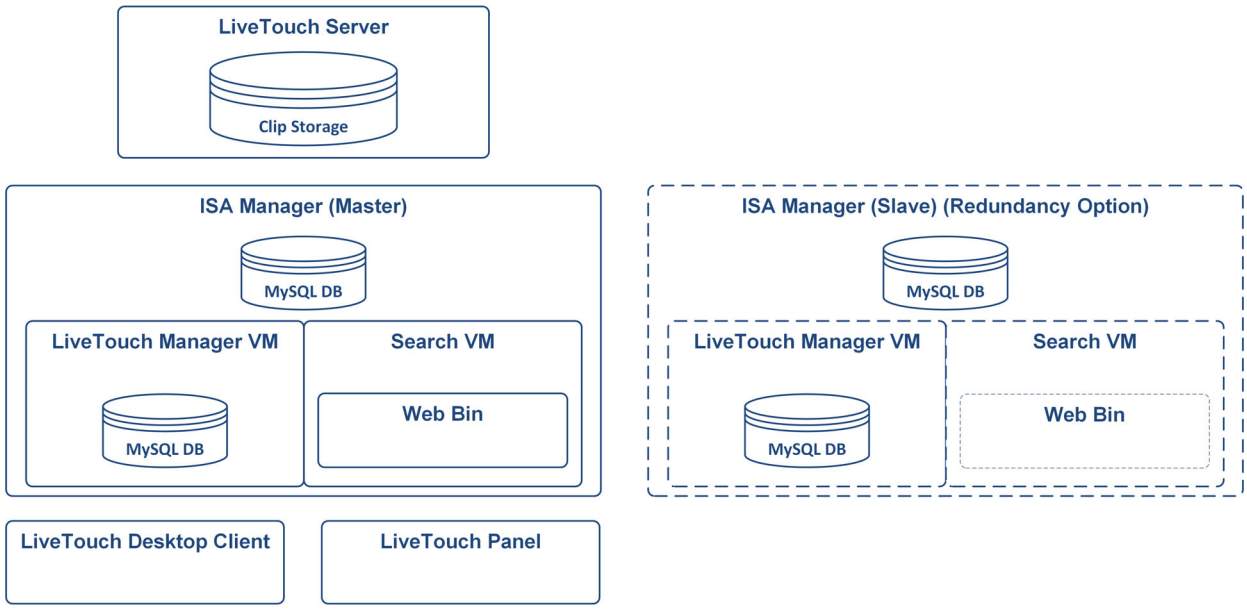


Fig. 6-1: LiveTouch System - Schematic Overview of Software Components

Installation and Configuration Checklist

The following steps summarize the installation of the software components in a LiveTouch system:

1. Check the configuration of the LiveTouch Server.
2. Install the ISA Manager Software.
3. Configure the Search VM on the ISA Manager.
4. Configure the LiveTouch Manager VM on the ISA Manager.

Before You Start

Make a note of the following static IP addresses, which you will need to enter during the installation and configuration process:

- ☐ IP address of LiveTouch Server: ___ . ___ . ___ . ___
- ☐ IP address of ISA Manager master: ___ . ___ . ___ . ___
- ☐ IP address of optional ISA Manager slave: ___ . ___ . ___ . ___
- ☐ IP address of Search VM (Master): ___ . ___ . ___ . ___
- ☐ IP address of Search VM (Slave): ___ . ___ . ___ . ___
- ☐ IP address of LiveTouch Manager VM (master): ___ . ___ . ___ . ___
- ☐ IP address of LiveTouch Manager VM (slave): ___ . ___ . ___ . ___
- ☐ IP address of LiveTouch Panel: ___ . ___ . ___ . ___
- ☐ IP address of LiveTouch Desktop Client: ___ . ___ . ___ . ___
- ☐ IP address of FileFlow Engine (optional): ___ . ___ . ___ . ___
- ☐ IP address of FileFlow Manager (optional): ___ . ___ . ___ . ___

Check the Status of the LiveTouch Server

The LiveTouch Server software is pre-installed in the factory before shipment. When installing a LiveTouch system, it is recommended to check its status using the Server web pages, enter: **http://***<LT_Server_IP_address>*

Switch between different options in the Status dropdown menu to view, for example, the status summary (see Figure 6-2 on page 62) or networking status (see Figure 6-3 on page 63).

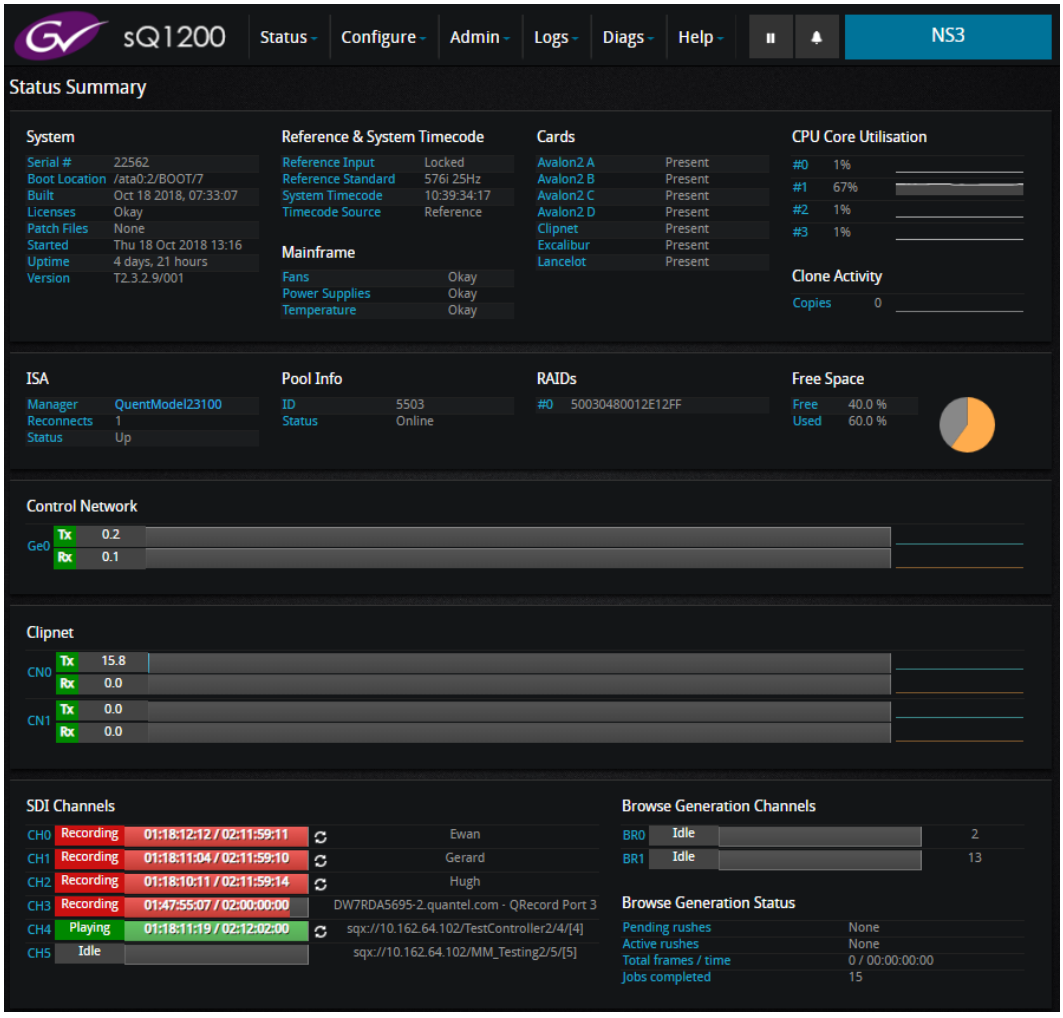


Fig. 6-2: LiveTouch Server Status Summary

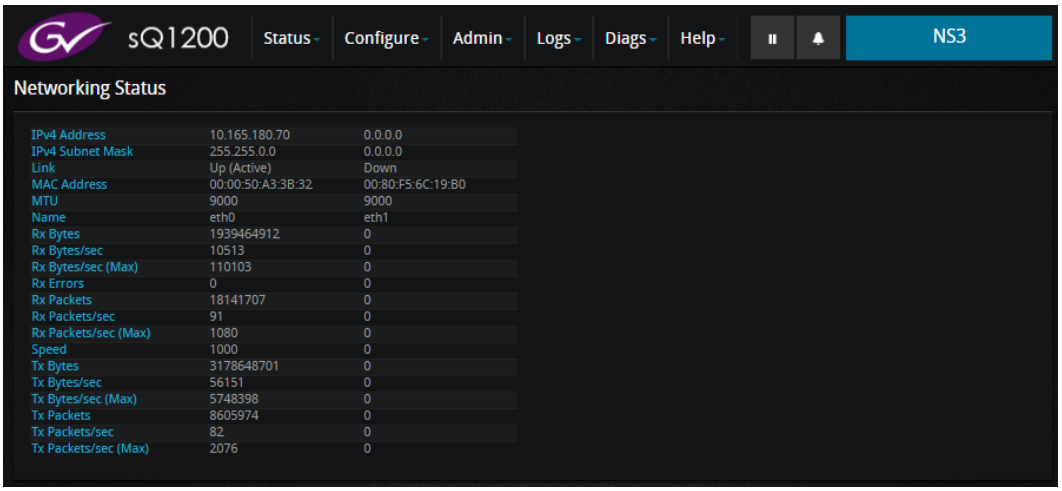


Fig. 6-3: LiveTouch Server Networking Status

Installing the ISA Manager Software

The ISA Manager provides the interfaces between the LiveTouch Server and the LiveTouch Desktop Client and Panel. The ISA runs two VMs used by LiveTouch: the **LiveTouch Manager VM** and the **Search VM**, which you need to configure after installing the ISA Manager software.

Follow this procedure to install the ISA Manager and the MySQL database engine:

1. Make sure you **switch off** the Windows firewall for the duration of the installation.
2. Locate the setup executable for the **ISA Manager V5.4.2.4** (or higher) in your File Explorer, and run the program.
3. At the Welcome screen, click Next.

Fig. 6-4: ISA Manager Software Installation - Welcome Screen

4. When the License Agreement is displayed, click **I Agree** to accept the licensing conditions and continue with the setup.

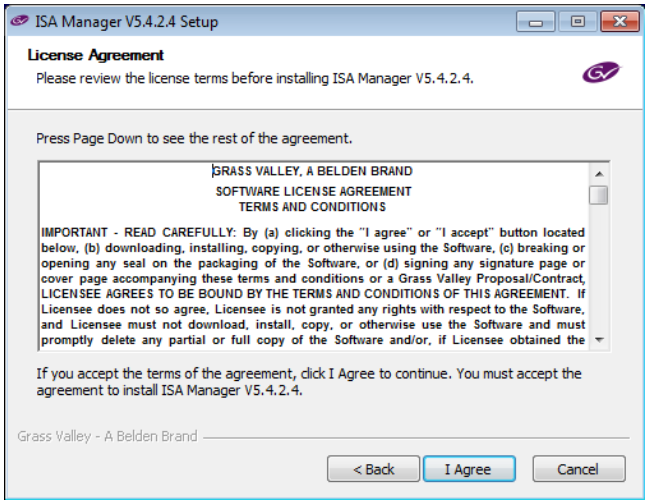


Fig. 6-5: ISA Manager Software Installation - License Agreement Screen

5 Enter the MySQL database passwords for the database users **root** and **quantel**, then click **Next**.

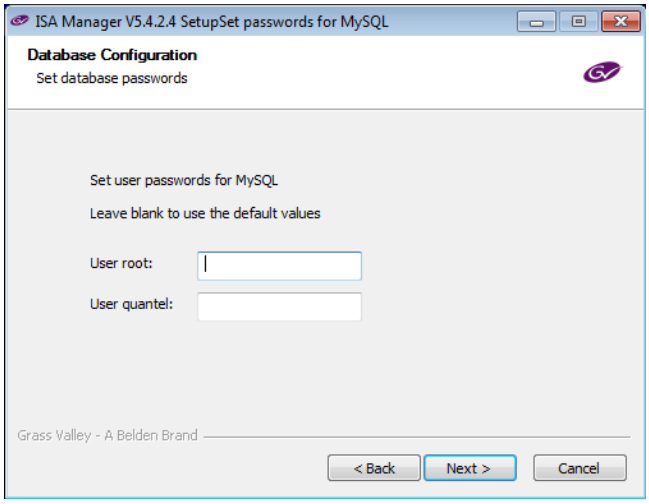


Fig. 6-6: ISA Manager Software Installation - Database Password Setting

If you leave the password fields blank, the default passwords are used as follows:

- No password for the user **quantel**.
- The password for the user **root** is the PC hostname as displayed in the Windows Computer Properties, all in lower-case characters.

6 Choose **Install Master** from the Type of install dropdown menu.

If installing an ISA slave, choose **Install Slave** from the dropdown.

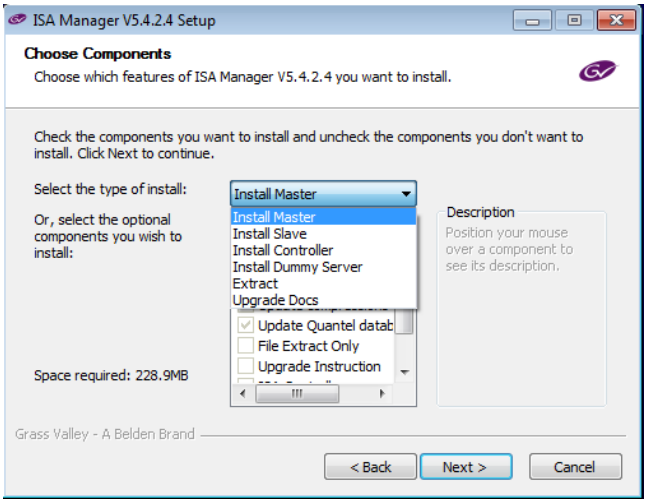


Fig. 6-7: ISA Manager Software Installation - Type of Installation

7 Confirm that all required ISA components to install are checked in the checklist, then press Next.

> **Note:** The available options are preselected based on the type of installation; you cannot select/deselect other options.

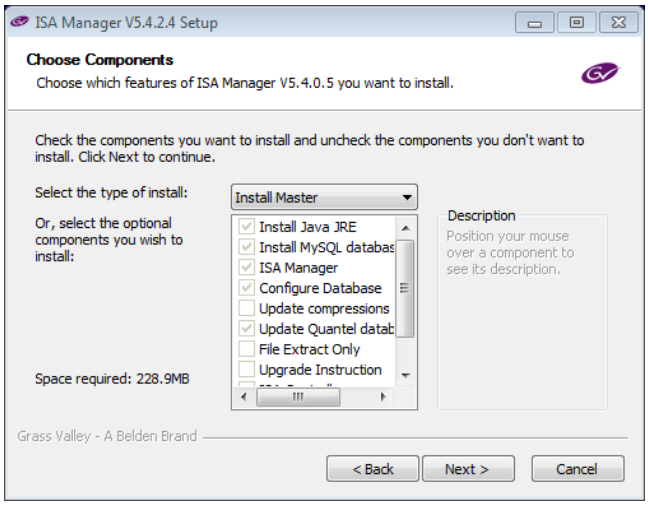


Fig. 6-8: ISA Manager Software Installation - Choosing Components to Install

8 Press Next to accept the default Start Menu folder: **Quantel\ISA Manager**.

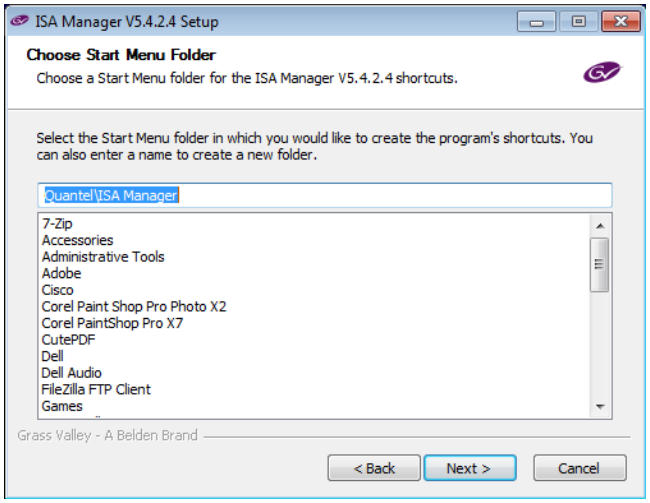


Fig. 6-9: ISA Manager Software Installation - Start Menu Folder

9 In the **Database Configuration** dialog, accept the default language collation (**uft8_general_ci**) for the database to determine the order in which searches are displayed.

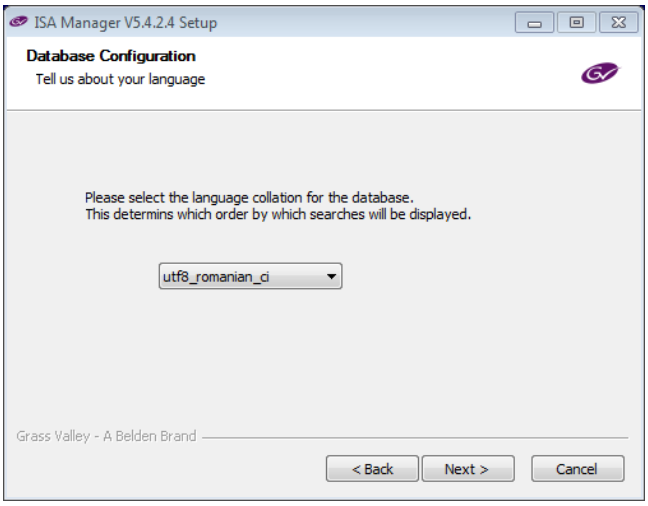


Fig. 6-10: ISA Manager Software Installation - Database Language Configuration

10 In the **Memory Configuration** dialog, the ISA contains 32 GB of memory by default so it is not a reduced memory system, press Next.

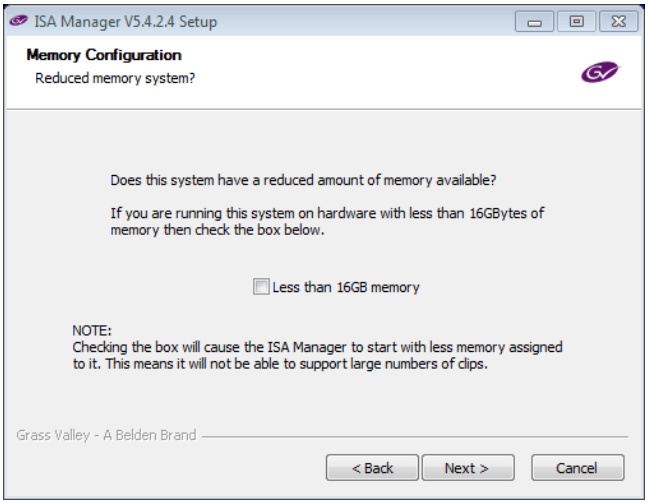


Fig. 6-11: ISA Manager Software Installation - Memory Configuration

11 Click Next in the **Development Configuration** dialog when installing a production system.

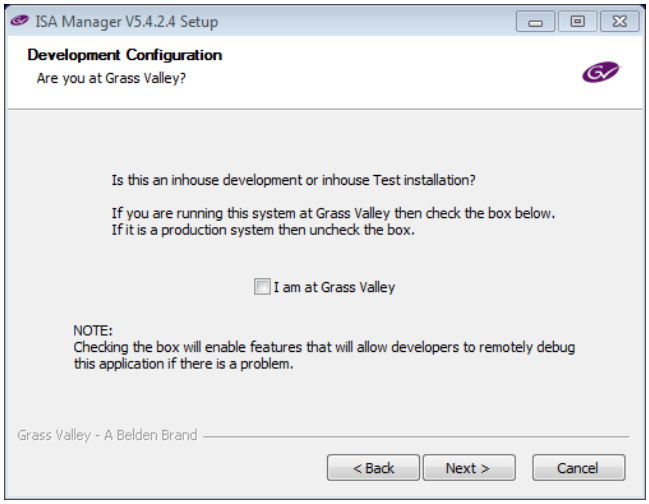


Fig. 6-12: ISA Manager Software Installation - Location of Installation

12 In the **Database Configuration** dialog, select the option: **Define my own configuration**

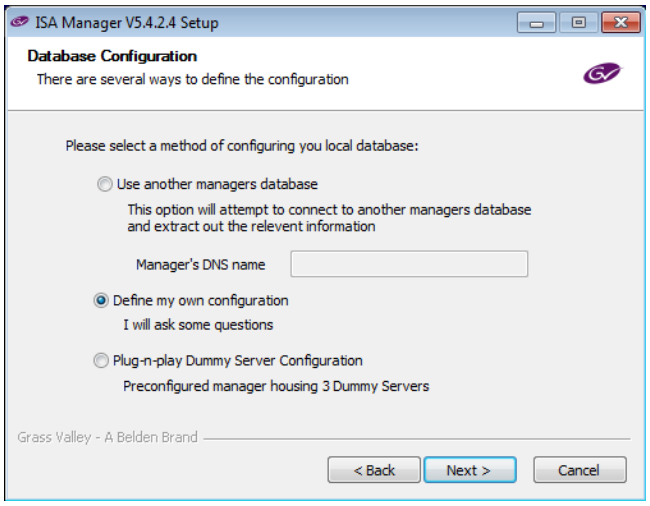


Fig. 6-13: ISA Manager Software Installation - Database Configuration Method

13 In the **Zone Configuration** dialog, enter the details for the zones to which the ISA belongs. For each zone, enter:

- Zone ID - for example, ZONE
- Zone Name - for example, QUAD CITIES
- Cluster Name - for example, CLUSTER

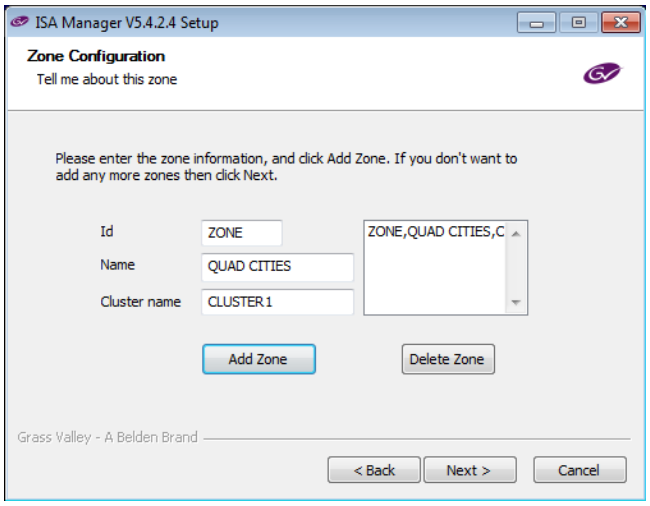


Fig. 6-14: ISA Manager Software Installation - Zone Configuration

14 In the **Server Configuration** dialog, enter the details of the server RAIDs so that they can be contacted by the ISA. Enter the IP address of the server and click **GetInfo** to load the Zone details.

Click Next to continue.

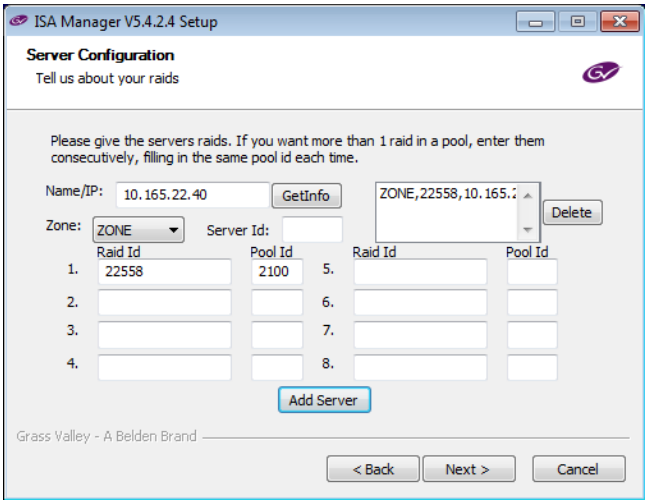


Fig. 6-15: ISA Manager Software Installation - Server RAID Configuration

15 In the **Pool Configuration** dialog, select the pre-configured Server ID from the drop-down menu then enter a memorable name for the Pool, for example, **LT Server**. Click **Save**, followed by Next to continue.

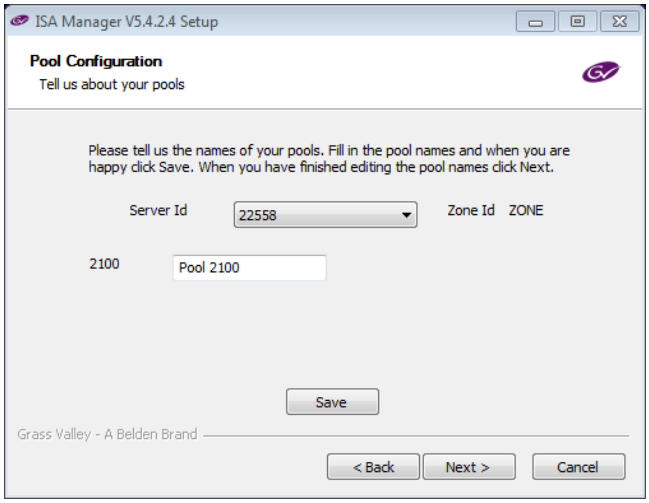


Fig. 6-16: ISA Manager Software Installation - Pool Configuration

16 The **Manager Configuration** dialog links the ISA to the Zone(s) you specified previously.

The Zone name should be passed through automatically. Enter the host name of the ISA as setup on the DNS, for example, QUENTModel12345. Click **Add Manager** to add the Zone to the list, then click Next.

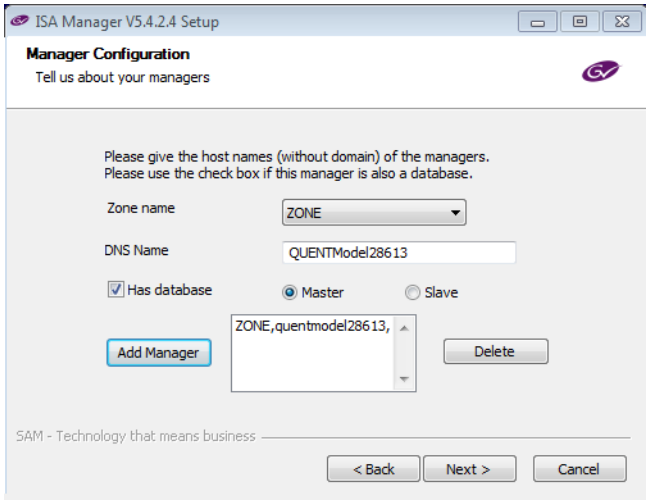


Fig. 6-17: ISA Manager Software Installation - Manager Configuration

17 Use the **Compressions** dialog to define the Video (SD and HD) and Audio (4-channel and 8-channel) compression formats used in LiveTouch. The default settings displayed depend on the system being installed, for example:

- Video SD compression format: 88, Legacy 9E Mpeg 50 480i30
- Video HD compression format: 601, AVC-I 100 1080i30 7f
- 4-channel Audio compression format: 269, Audio 4 channel, 24 bit, 30 fps
- 8-channel Audio compression format: 271, Audio 8 channel, 24 bit, 30 fps

Press Next to continue.

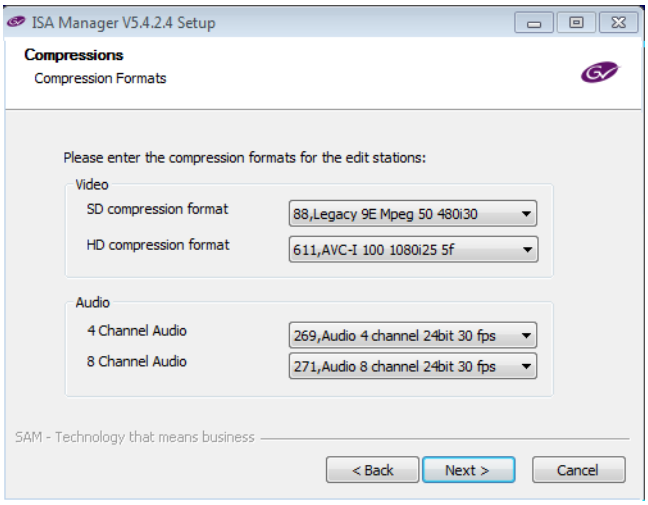


Fig. 6-18: ISA Manager Software Installation - Compressions

18 In the AAF dialog, enter the path for the AAF file share if your system needs to read legacy, file-based AAF files. Generally accept the default, then press Next.

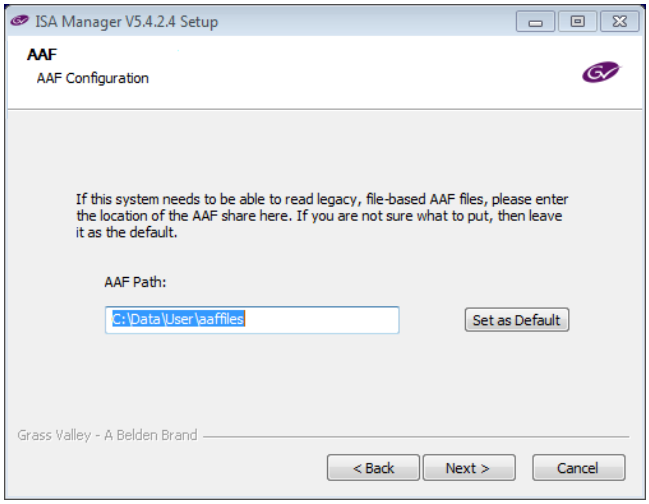


Fig. 6-19: ISA Manager Software Installation - AAF Configuration

19 The IOR dialog specifies the port from which the CORBA Interoperable Object Reference (**IOR**) must read. Accept the default port number **2096**, then click Next.

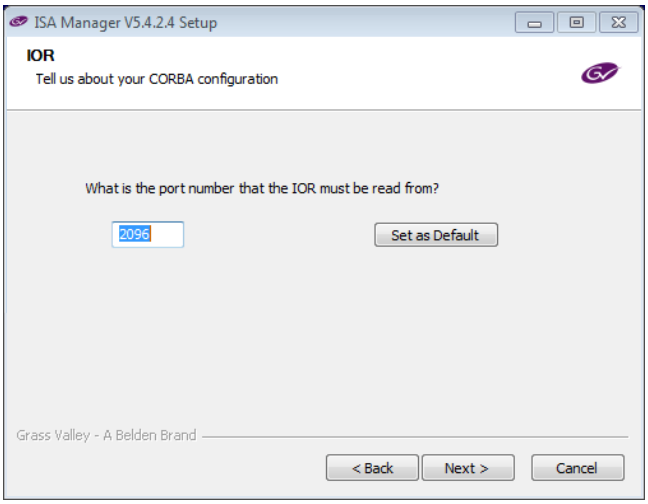


Fig. 6-20: ISA Manager Software Installation - IOR CORBA Configuration

20 Select the desired framerate of the LiveTouch system, depending on the target region, from:

- 25/50 Hz: Europe, Australia, etc. (PAL/625)
- 30/60 Hz: The Americas, Japan, etc. (NTSC/525)

Click Next to continue.

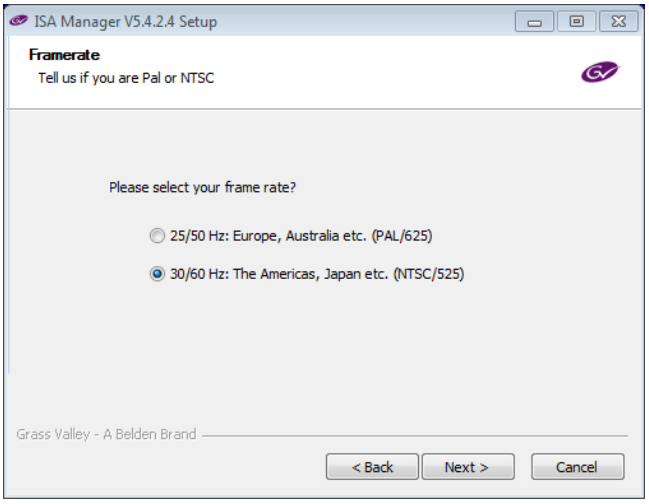


Fig. 6-21: ISA Manager Software Installation - Framerate Configuration

21 In the **Legacy** dialog, accept the default of **Non-Legacy mode**, then click Next.

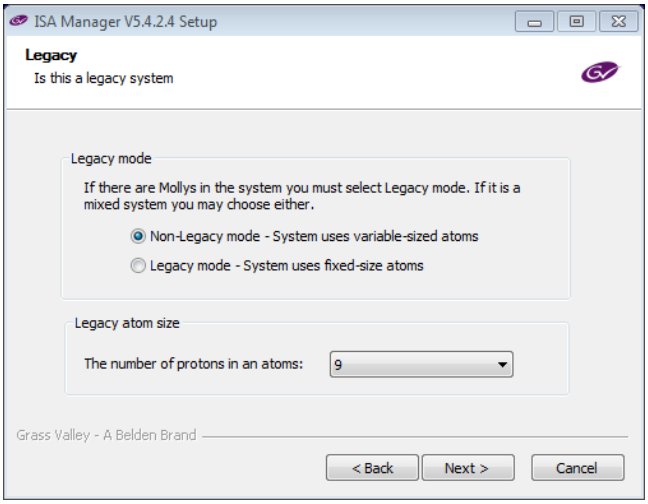


Fig. 6-22: ISA Manager Software Installation - Legacy Mode

22 The Sequence dialog is intended to create a hierarchical sequence, for a system with multiple zones, to avoid conflicts. For a single zone, select **No** (default), then click **Install** to start the installation of the ISA Manager database software.

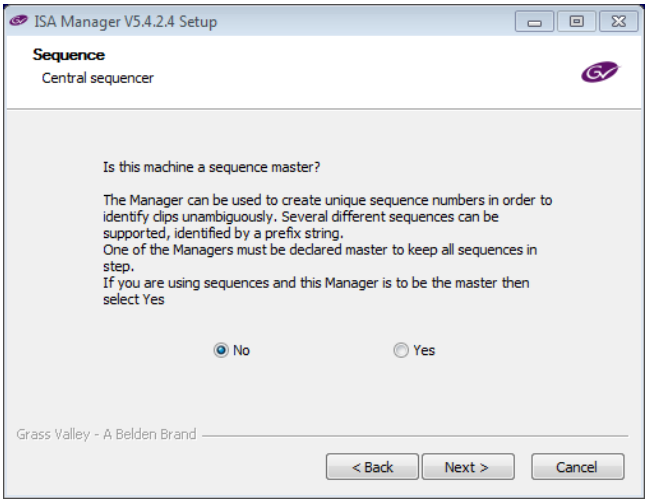


Fig. 6-23: ISA Manager Software Installation - Sequence Configuration

23 For a standard LiveTouch system, the ISA Manager installation should take about 1 to 2 minutes to complete. A system with multiple zones will take longer.

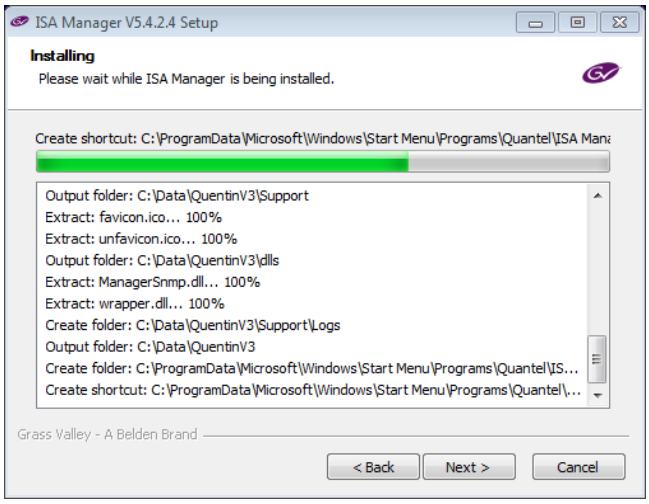


Fig. 6-24: ISA Manager Software Installation in Progress

24 On completion, you should see the following completion splash screen. Click **Finish** to quit the installation wizard.

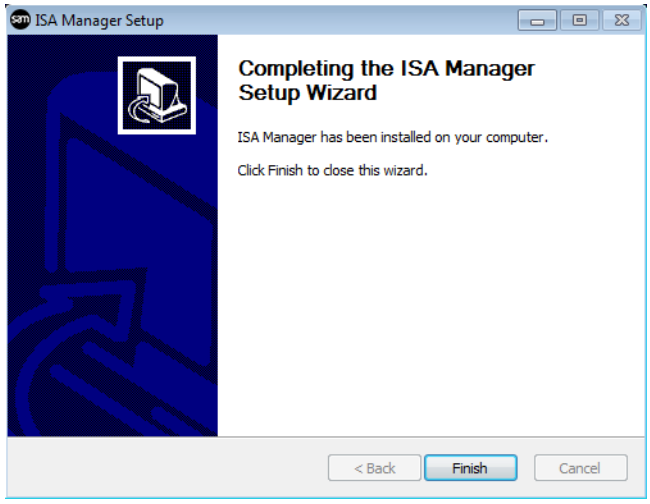


Fig. 6-25: ISA Manager Software Installation Completion

You should now see the following icons on your Desktop:

- **Run up files**: Front-end of the MySQL database.
- **Manager**: Used to start the ISA Manager.
- **Controller**: Used to start the ISA Controller software.
- **Manager UI**: Opens a webpage Dashboard used to configure and search the ISA Manager when it is running.

Checking the Installation of the ISA Manager

First, make sure that the ISA Manager software runs-up correctly, then check the installation of the ISA Manager software as follows:

1 Open the LiveTouch Server web page: http://<*Server_IP_Address*>

2 In the ISA section of the **Status Summary**, check the ISA name is registered and its status shown as **Up**.

3 Confirm that the Pool Info(rmation) and RAIDs are defined correctly.

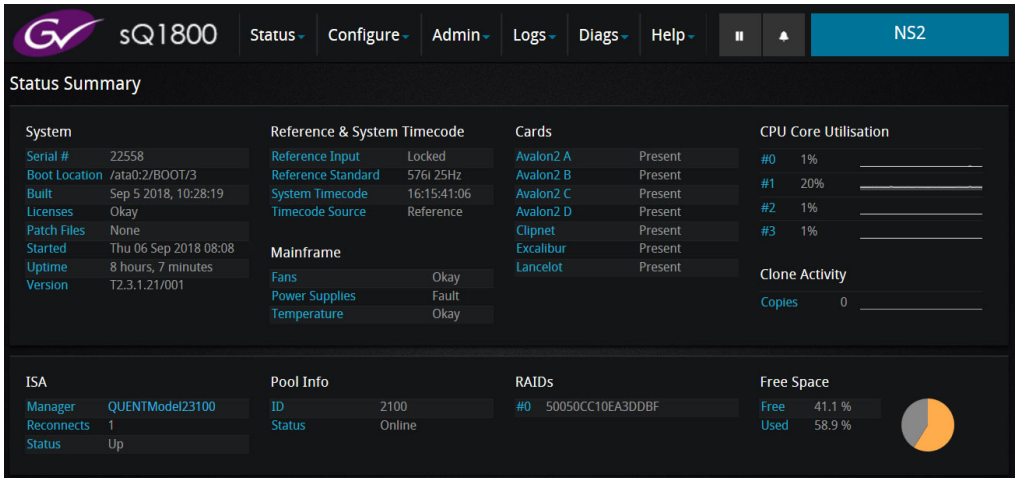


Fig. 6-26: LiveTouch Server - Status Summary

4 Select: **Configure > Quentin ISA Configuration**

Confirm that the IP addresses of the ISA hosts are set up correctly in the LiveTouch Server **Quentin ISA Configuration** web page.

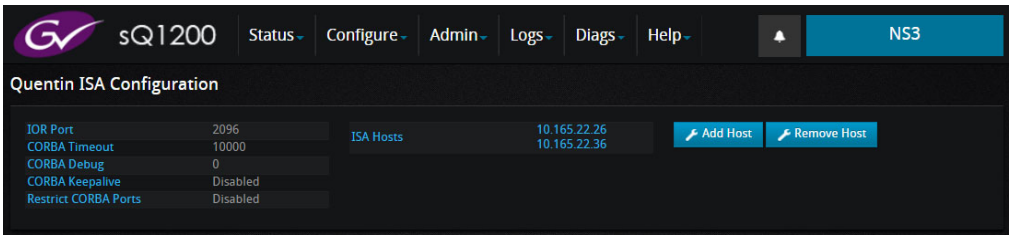


Fig. 6-27: ISA Configuration Details on the LiveTouch Server

5 Select: **Configure > SDI Channels.**

Confirm that the ISA is recording the live feeds expected and that **Always In Record** is set to **On**.

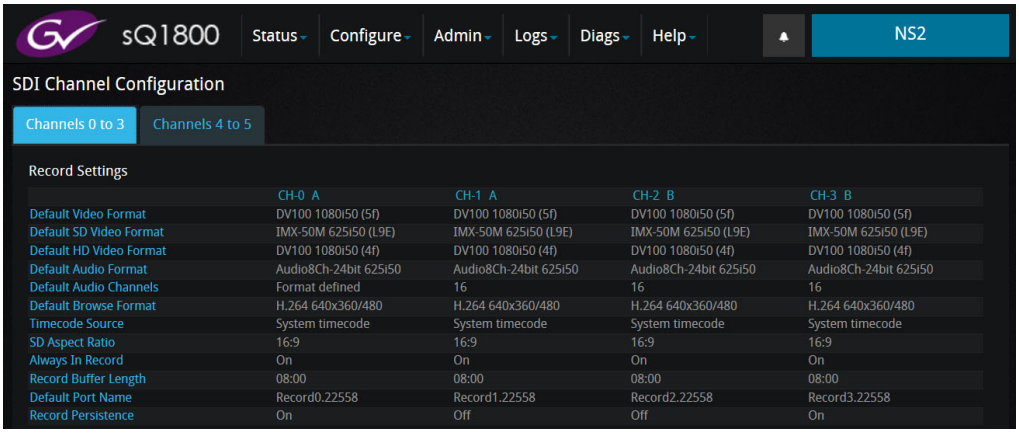


Fig. 6-28: ISA Configuration - SDI Channel Configuration

6 Select: **Status > SDI Channels.**

Check the test signal color bars in the output channels:

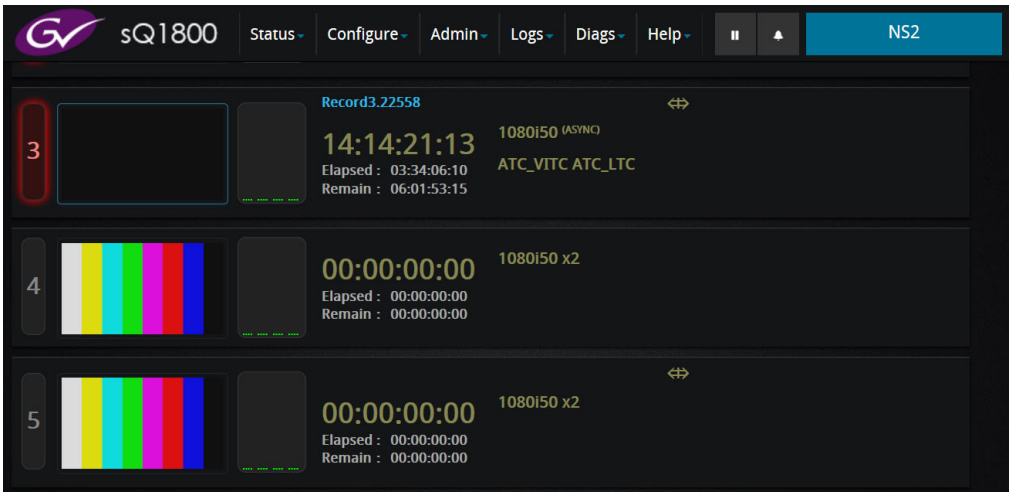


Fig. 6-29: ISA Configuration - SDI Channel Status

Once you are satisfied that the ISA Manager software is installed correctly, continue by installing the two VMs on the ISA Manager.

Installing and Configuring the VMs on the ISA

Each ISA Manager includes two virtual machines (VMs), which need to be configured as described in the following sections:

- **Search VM** - used as a search buffer by the Web Bin.
- **LiveTouch Manager VM**

For a schematic overview, see Figure 6-1 on page 60.

Configuring the Search VM

Set-up the **Search VM** as follows:

1 Locate the zip file containing the Search Service components: **Search V2.0.1.0.zip** installed with the ISA Manager.

2 Create a folder: **C:\Data**

3 Double-click the zip file and **Extract** the contents to the folder: **C:\Data**.

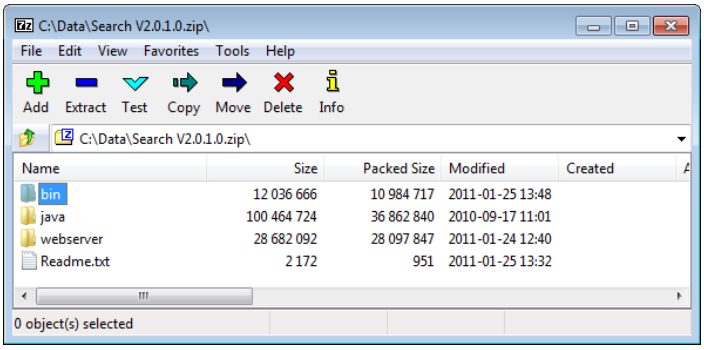


Fig. 6-30: Search VM Zip File Contents

The Search service distribution contains the following folders:

- **java:** Java runtime environment.
- **webserver:** Jetty web server containing the **Search** and **Solr** web applications.
- **bin:** Folder containing scripts to configure, start and stop the search service.

Refer to the **Readme.txt** file for more information.

4 Navigate to the folder: **C:\Data\bin**

5 Run the batch file: **addshortcuts.bat**.

This writes the Search VM shortcuts to the Desktop.

6 Navigate to the folder: **C:\Data\webserver\quantel**.

7 Open the file **Config.xml** in a text editor (e.g., Notepad++).

a In the **<URLs>** section, enter a comma-separated list of the URLs to the ISA Manager's IOR, in the format: http://*IP_address*:*Port*

For example:

<URLs>http://10.165.1.2:2096</URLs>

b In the **<User>** section, enter the username of an ISA Manager database user with at least read-only privileges on the clips table.

For example:

<User>quantel</User>

c In the **<Password>** section, enter the password of the ISA Manager database user specified above.

If user quantel, leave blank unless changed during the ISA Manager installation.

8 Save your changes to the **Config.xml** file.

9 Make sure that you have set the correct IP address and are connected to the ISA.

10 Double-click the Desktop shortcut: **Search V2.0.1.0**

11 Double-click the file: **Start search.bat**.

Note: If you need to stop the Search service, run: **Stop search.bat**.

You should see the following message indicating that Search is ready:

```
Waiting for an indexing operation to be submitted.
```

12 Configure the Search VM to start-up automatically as follows:

a Click **Start**, then right-click on **All Programs**.

b Select: **Open All Users**.

c Navigate to the folder: **Programs: Startup**

d Copy **Start Search** icon from the Desktop and paste into the **Startup** folder.

13 Add the **Search Path** parameter to the ISA Manager as follows:

a Start the ISA Manager user interface:

b Select: **Configure: Properties**

c Scroll down and select: **Search path**.

d Set the **Value** parameter to the IP address on which the Search service is running in the format: http://*IP_address*:*Port*

For example: http://10.162.50.20:8182/

e Click **Create** to enter into the ISA database.

f Click the Refresh Database button at the top of he web page to refresh the databasewith your changes.

g Close the ISA Manager web application.

14 Check that the Search VM is running by opening an Internet Explorer window and enter:

http://localhost:8182/quantel/search/select?q=*

This searches all clips and will display a list of any clips visible to the ISA.

Installing the MySQL Database for the LiveTouch Manager VM

> **Note:** Do not install the LiveTouch Manager component on the host ISA system as both products use MySQL and this would lead to conflicts.

The LiveTouch Manager VM uses a MySQL database component, which must be installed on the ISA Manager as follows:

1 Locate the MySQL install package: **mysql-5.5.40-winx64.msi** and double-click to run the Setup Wizard.

2 When the MySQL Server 5.5 Setup Wizard starts, click **Next** to proceed.

Fig. 6-31: MySQL Server 5.5 Setup Wizard

3 Accept the licensing terms in the **End-user License Agreement** screen by selecting the checkbox, then click Next.

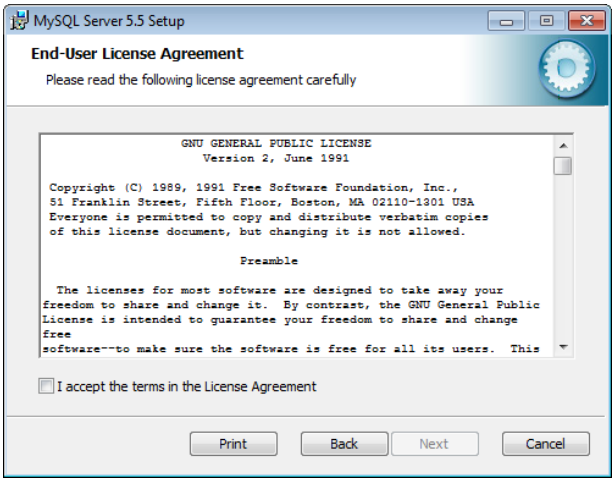


Fig. 6-32: MySQL Server 5.5 Setup Wizard - License Agreement

4 Select the setup type: **Custom** then click Next.

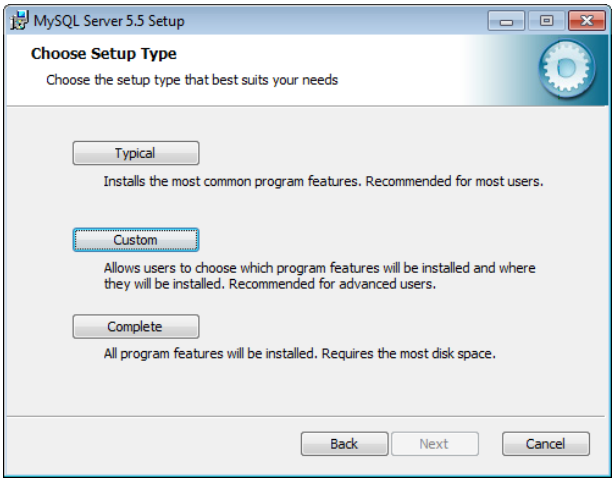


Fig. 6-33: MySQL Server 5.5 Setup Wizard - Setup Type

5 In the Custom setup dialog:

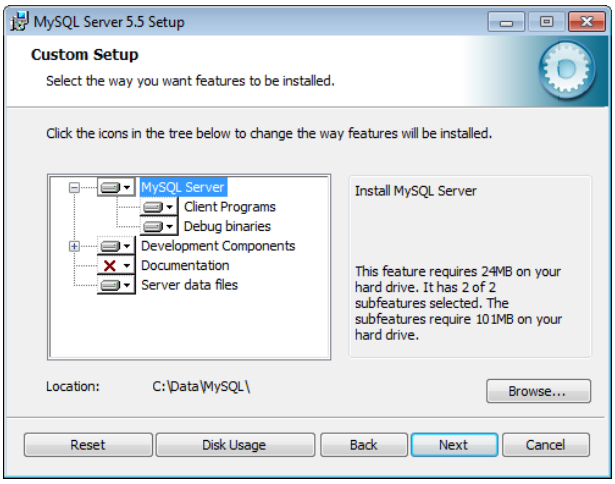


Fig. 6-34: MySQL Server 5.5Setup Wizard - Custom Setup

a Select **MySQL** Server, click **Browse...**, and select the folder: **C:\Data\MySQL**

If the folder does not already exist, simply enter the path and the installation will create the folder.

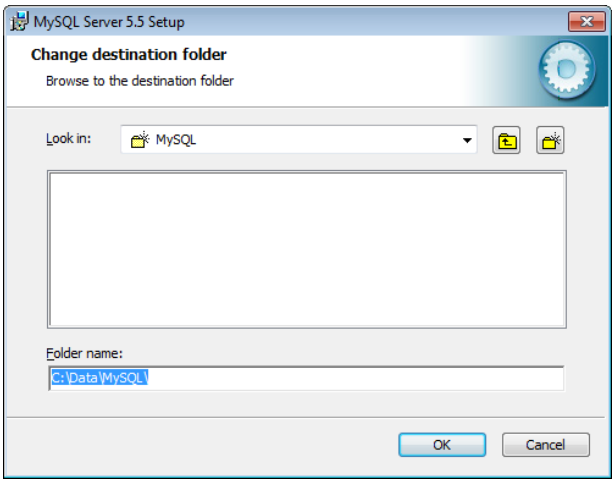


Fig. 6-35: MySQL Server 5.5 Setup Wizard - Browsing to Change Destination Folder

b Select **Server Data Files**, click **Browse...**, and select the folder: **C:\Data\MySQL** Click Next.

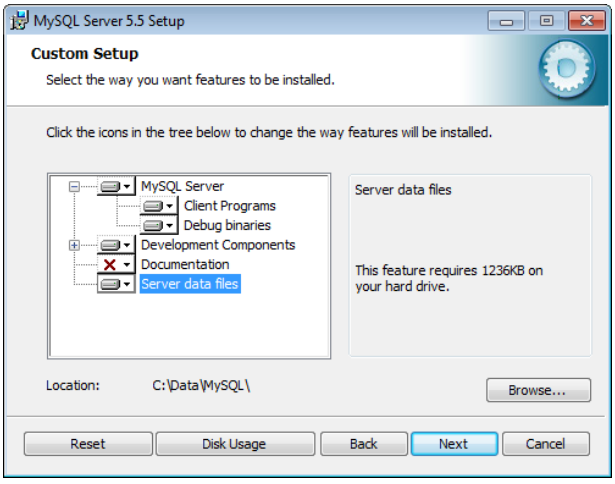


Fig. 6-36: MySQL Server 5.5 - Setup Wizard

6 Click **Install** when ready to install MySQL Server 5.5

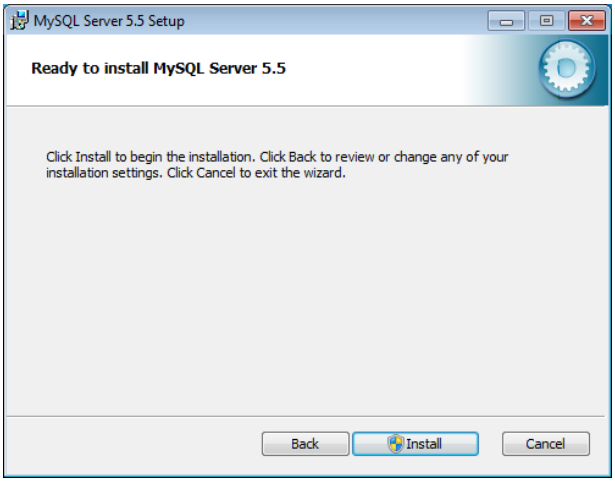


Fig. 6-37: MySQL Server 5.5 Setup Wizard - Start Install

7 Click Next, then Next again.

8 In the **Completed Setup** dialog, select the **Launch the MySQL Instance Configuration Wizard** checkbox, then click Finish.

This launches the MySQL Configuration Wizard.

Configuring the MySQL Database for the LiveTouch Manager VM

Using the MySQL Configuration Wizard, which should have started up automatically, configure the MySQL database as follows:

1 In the User Account dialog, click **Yes** to allow the configuration program to make changes.

2 In the Configuration Wizard Welcome screen, click Next to start the MySQL database configuration.

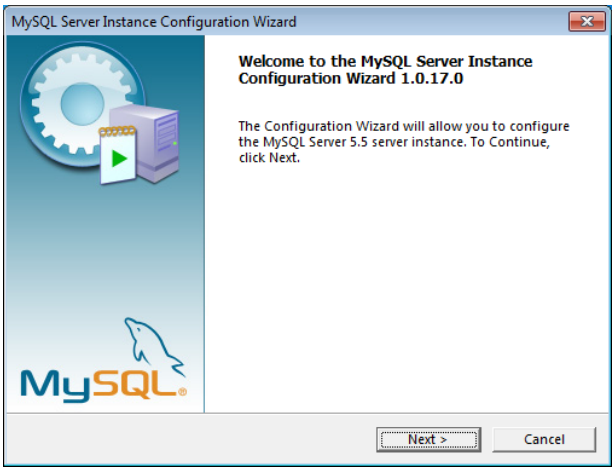


Fig. 6-38: MySQL Server Configuration Wizard - Start Configuration

3 In the **Configuration Type** dialog, select **Detailed Configuration**, then click Next.

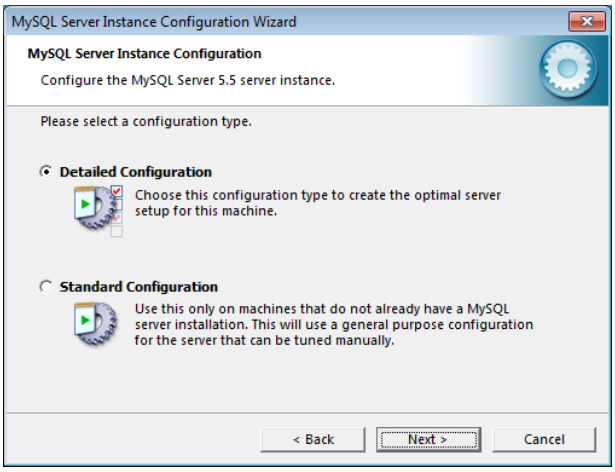


Fig. 6-39: MySQL Server Configuration Wizard - Configuration Type

4 In the **Server Type** dialog, select **Server Machine**, then click Next.

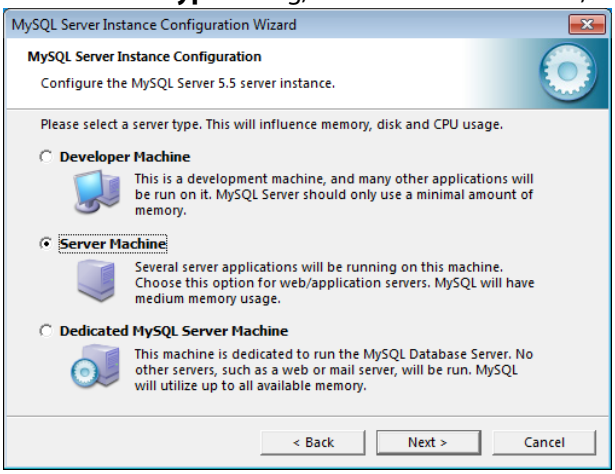


Fig. 6-40: MySQL Server Configuration Wizard - Server Type

5 In Configuration Wizard #5, select **Transactional Database Only**, then click Next.

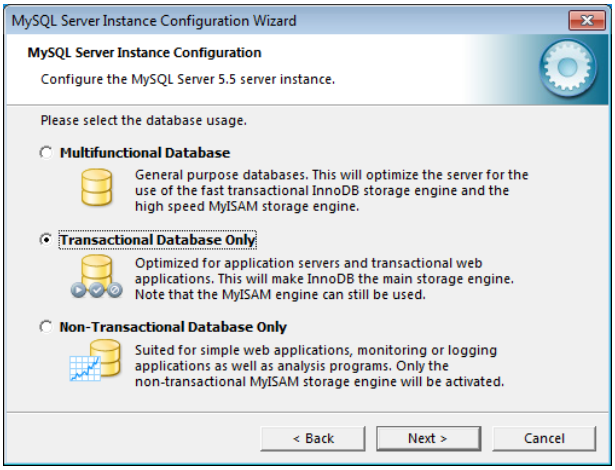


Fig. 6-41: MySQL Server Configuration Wizard - Database Usage

6 In the **InnoDBDatafile Drive** dialog, accept the default path for **InnoDB Tablespace Settings** as C:\<*Installation Path*>

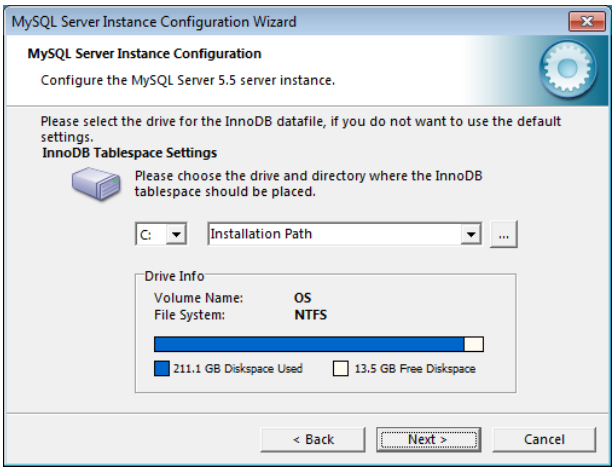


Fig. 6-42: MySQL Server Configuration Wizard - InnoDB Datafile Drive

7 In the **Concurrent Connections** dialog, select **Manual Setting.**
In the **Concurrent connections** field, enter **100**, then click Next.

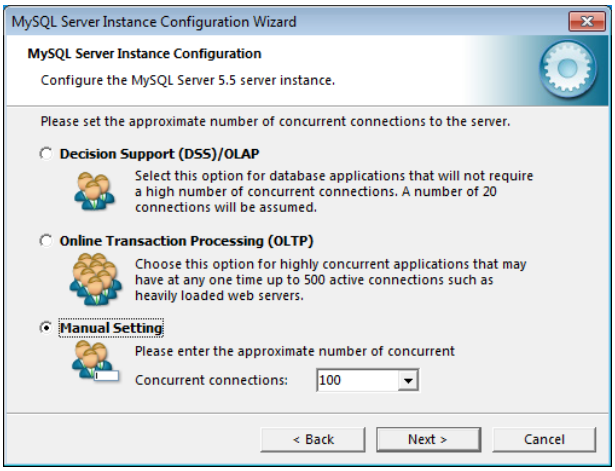


Fig. 6-43: MySQL Server Configuration Wizard - Concurrent Connections

8 In the **Networking Options** dialog:

a Ensure that the option **Enable TCP/IP Networking** is selected and the **Port Number** is set to: **3306**.

b Select the option: **Add firewall exception for this port**.

c Ensure that the option **Enable Strict Mode** is selected, then click Next.

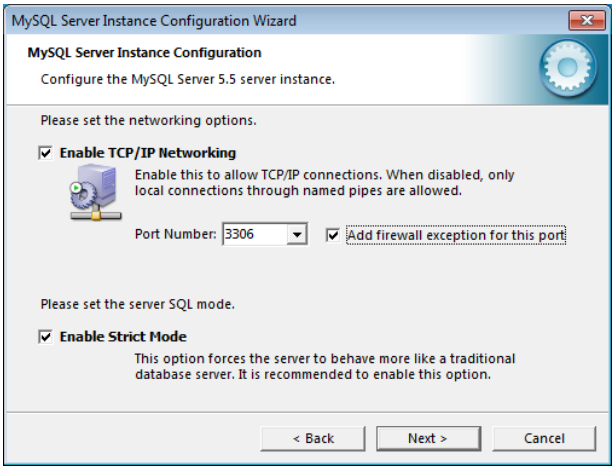


Fig. 6-44: MySQL Server Configuration Wizard - Networking Options

9 In the **Default Character Set** dialog, select **Best support for multilingualism**, then click Next.

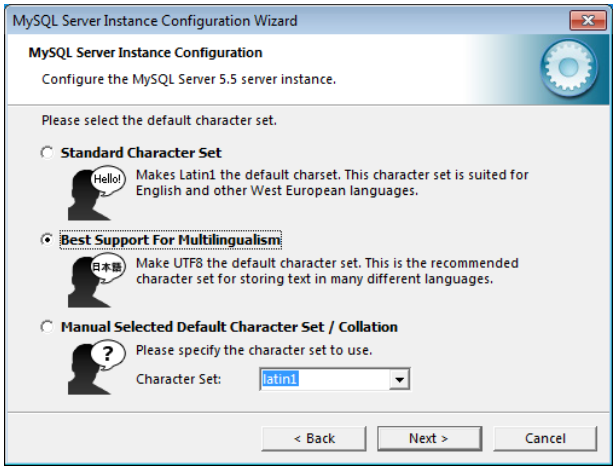


Fig. 6-45: MySQL Server Configuration Wizard - Default Character Set

10 In the **Windows Options** dialog:

a Ensure that the option **Install as Windows Service** is selected and the **Service Name** is set to: **MySQL**.

b Select the option: **Launch the MySQL Server automatically**.

c Select the option: **Include Bin Directory in Windows Path**, then click Next.

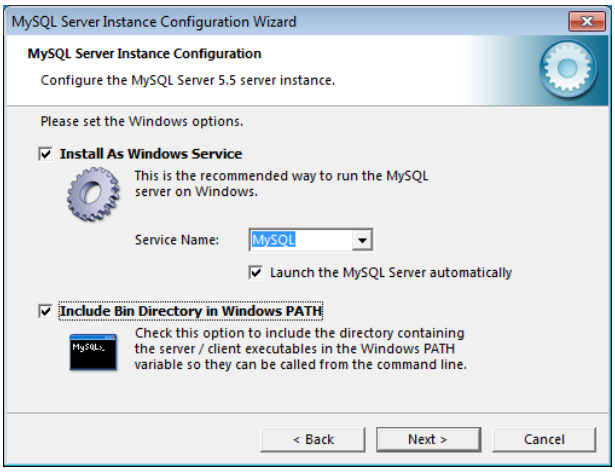


Fig. 6-46: MySQL Server Configuration Wizard - Windows Options

11 In the **Security Options** dialog:

a Select the option **Modify Security Settings**.

b Enter the root password: **quantel**

c Re-enter the root password in the Confirm field.

d Leave the option **Create an Anonymous Account** unselected.

e Select the option: **Enable root access from remote machines**, then click Next.

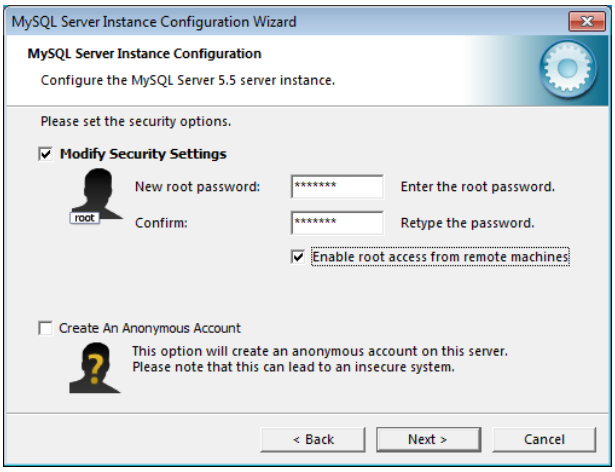


Fig. 6-47: MySQL Server Configuration Wizard - Security Options

12 In the **Ready to Execute** dialog, click **Execute** to configure the database, then **Finish**.

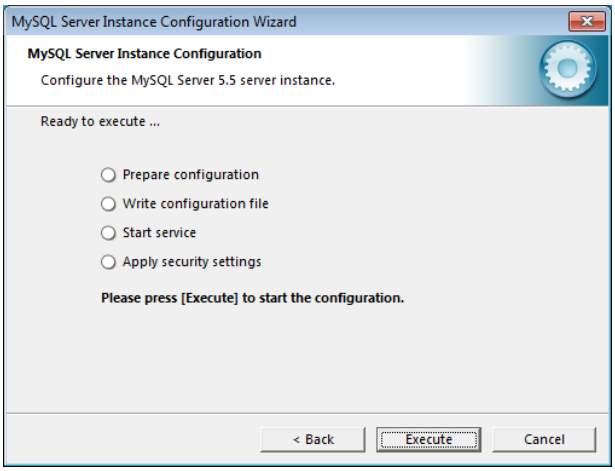


Fig. 6-48: MySQL Server Configuration Wizard - Ready to Execute

You should see the message *Processing configuration...* displayed.

Installing the Chrome Browser Software

If not already installed, install the Chrome browser software as follows:

1 Double-click the Chrome install package: **ChromeSetup.exe**
2 In the **User Account** dialog, click **Yes**.
3 In the **Welcome to Chrome** dialog, click **Next**.
4 When prompted **How do you want to open this type of link (http)?** select **Google Chrome**.
5 When prompted to sign in to Chrome, click **No thanks**.

Proceed to install the LiveTouch Manager VM software, as described in the next section.

Installing the LiveTouch Manager VM Software

Install the LiveTouch Manager VM software as follows:

1 Locate the LiveTouch Manager installation package: **LiveTouch-Manager-Vx.x.x.exe**, right-click and select **Run as administrator**.

For example: **LiveTouch-Manager-V1.10.1.exe**

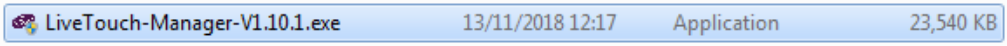


Fig. 6-49: LiveTouch Manager Software Installation - Executable

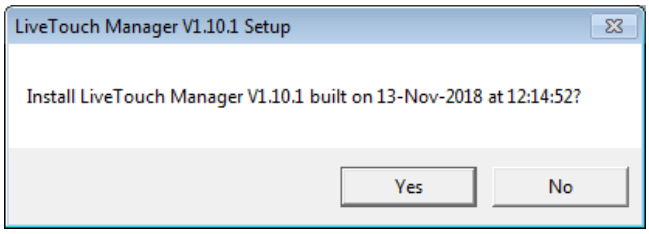


Fig. 6-50: LiveTouch Manager Installation Start Dialog

2 Click **Yes** to start the installation process.

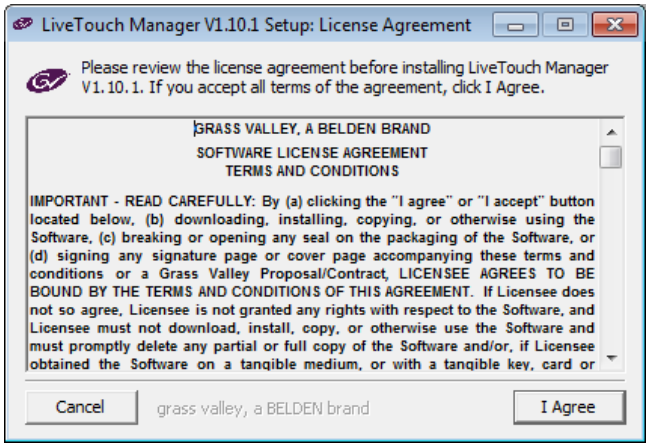


Fig. 6-51: LiveTouch Manager Software Installation - License Agreement

3 Click **I Agree** to accept the license terms and start the installation.

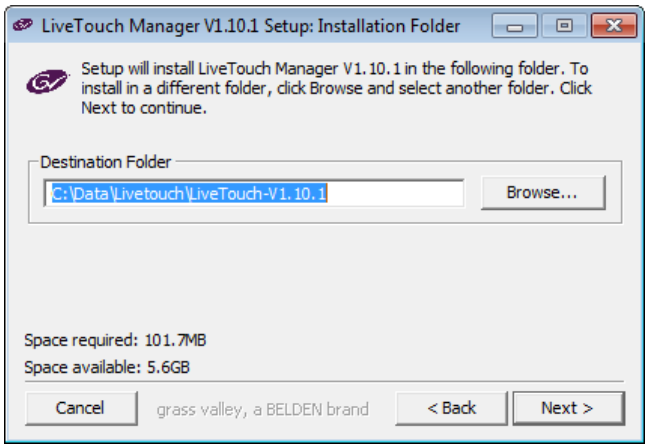


Fig. 6-52: LiveTouch Manager Software Installation - Software Destination Folder

4 In the Installation Folder dialog, accept the default destination folder by clicking Next.
C:\Data\Livetouch\LiveTouch-V1.10.1

5 Enter the URLs for the installed ISAs:

- Master (ISA 1): http://*<IP_address>*
- Slave (ISA 2) (optional): http://*<IP_address>*

Click Next to continue.

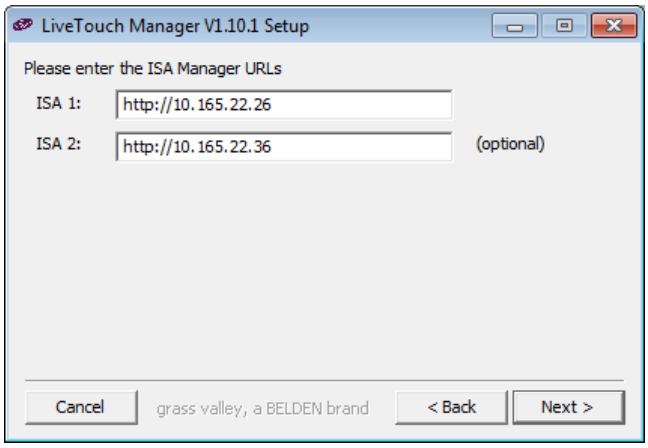


Fig. 6-53: LiveTouch Manager Software Installation - ISA Manager URLs

6 Select the option that this installation will **not use a site manager** then click Next.

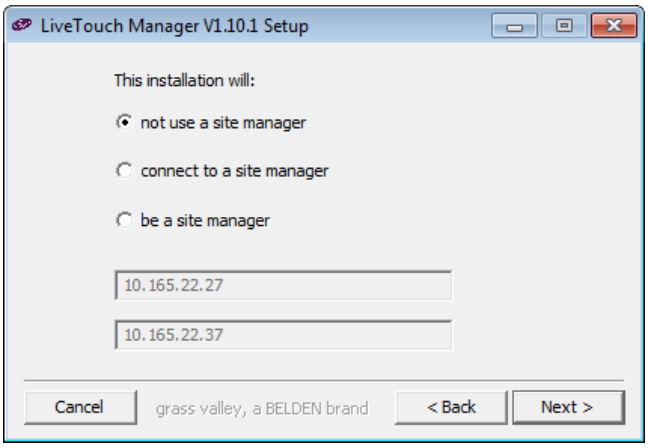


Fig. 6-54: LiveTouch Manager Software Installation - Site Manager Definition

7 When prompted for the MySQL server IP addresses, enter the IP address of the LiveTouch Manager VM that you are currently installing.

If installing an ISA system with Master/Slave redundancy, enter the IP address of the Master in the **server 1** field and the Slave in the **server 2** field.

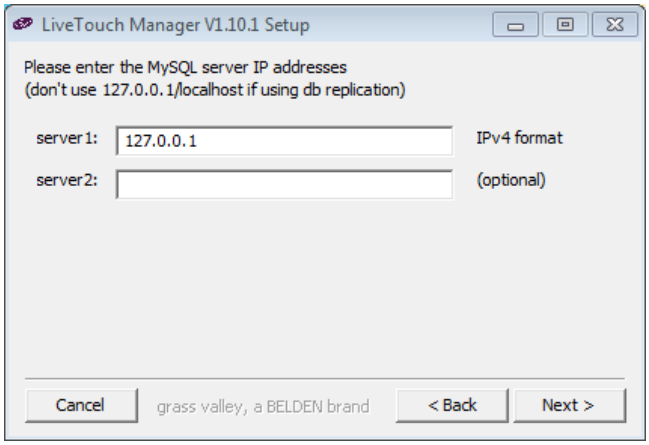


Fig. 6-55: LiveTouch Manager Software Installation - MySQL Server IP Address

8 If running only a single ISA, leave the field in the following dialog blank.

If running a Master/Slave ISA configuration, enter the IP address to identify the master or slave you are currently configuring.

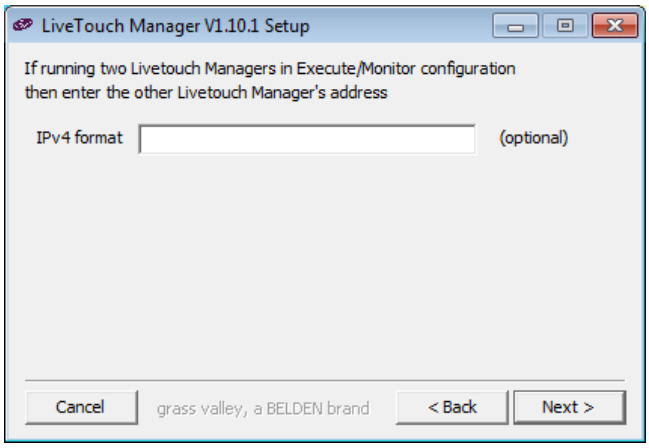


Fig. 6-56: LiveTouch Manager Software Installation - ISA Slave IP Address

9 Enter the IP address of a Witness Node, usually the LiveTouch Desktop Client, which can be pinged by the LiveTouch Manager VM to verify network integrity. Click Next to continue.

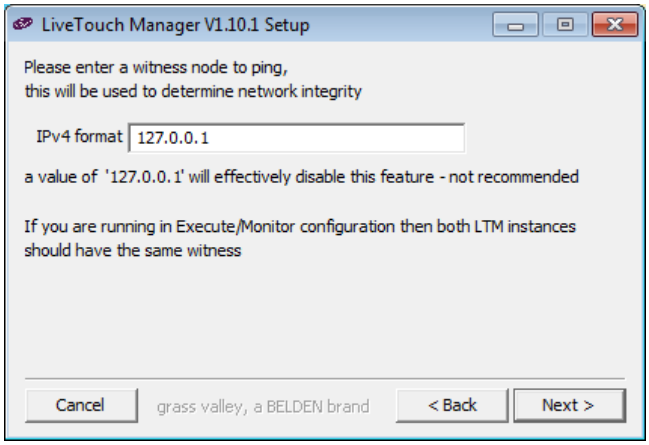


Fig. 6-57: LiveTouch Manager Software Installation - Witness Node Setup

This starts the installation process.

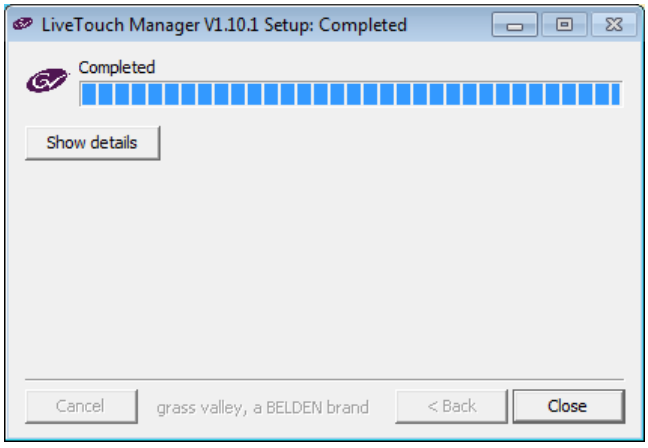


Fig. 6-58: LiveTouch Manager Software Installation - Completion

10 Click Show Details to view the detailed output from the install.

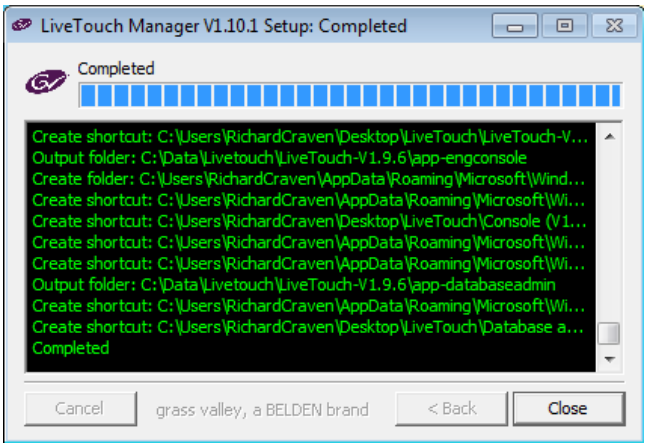


Fig. 6-59: LiveTouch Manager Software Installation - Summary

11 Click **Close** to complete the installation.

12 If running a Master / Slave ISA configuration, run the LiveTouch Manager installation again but specify the details for the Slave ISA.

13 When configuring the LiveTouch Manager on the Slave ISA:

a In the **IS Manager URL** dialog, enter the ISA URLs in the same order as previously:

- For ISA 1: Enter URL of Master ISA.
- For ISA 2: Enter URL of Slave ISA.

b In the **MySQL Server IP address** dialog, enter the IP addresses in the opposite order:

- For server1: Enter IP address of MySQL database on slave.
- For server2: Enter IP address of MySQL database on master.

c For the **LiveTouch Managers address** when running two LiveTouch Managers in master/slave configuration, enter:

- For IPv4 format: Enter IP address of LiveTouch Manager on slave.

Setup the IP Address of the Desktop Client PC

Set the IP address of the Desktop Client PC as follows:

1 From the Windows Start menu of the Desktop Client PC, select:
Control Panel > Network and Internet > Network and Sharing Center

2 Click the **Local Area Connection** link to open the Local Area Connection Status dialog.

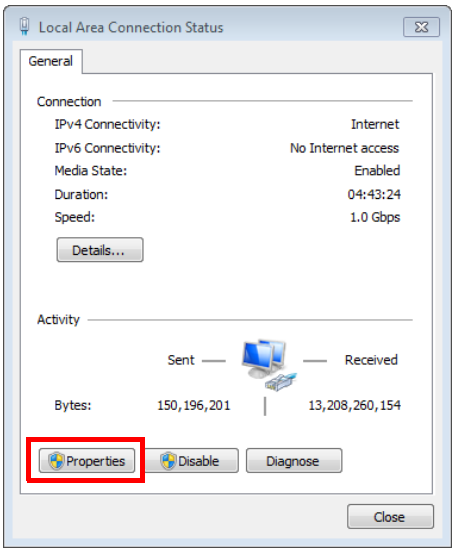


Fig. 6-60: Local Area Connection Status on Desktop Client PC

3 Click **Properties** to open the Local Area Connection Properties

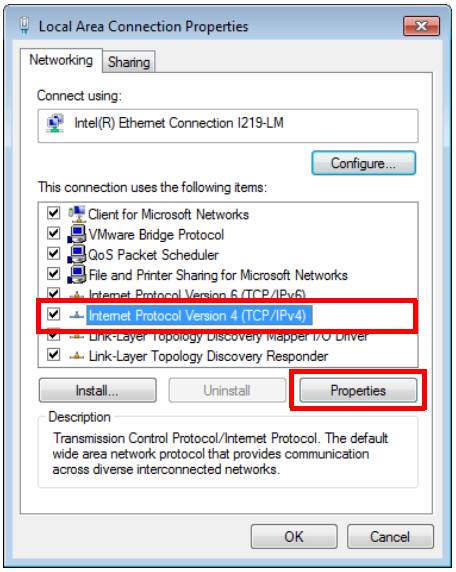


Fig. 6-61: Local Area Connection Properties on Desktop Client PC

4 Select the connection entry **Internet Protocol Version 4 (TCP/IPv4)**, then click **Properties**.

This opens the Internet Protocol Version 4 (TCP/IPv4) Properties dialog.

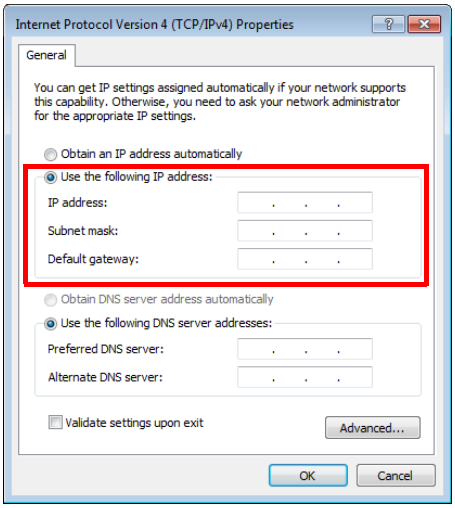


Fig. 6-63: Internet Protocol Version 4 (TCP/IPv4) Properties

5 Select the option: **Use the following IP address**.

6 Enter the IP address, Subnet mask and Default gateway for the Desktop Client PC into the appropriate fields.

7 Click **OK** to apply the IP address.

Initialize the MySQL Database for the LiveTouch Manager VM

Initialize the MySQL database as follows:

1 On the LiveTouch Manager, open the folder: **LiveTouch**.

2 Right-click **Database Administration** and select: **Run as Administrator**.

3 In the User Account dialog, click **Yes**.

4 In the **Database server administration** dialog, select **Setup My SQL Installation** from the dropdown in the **Choose Operation** field, then click **Go**.

5 Click **Yes** to confirm the operation.

6 Restart the MySQL service as follows:

   a From the Windows Start menu, select:

   Control Panel > System and Security > Administrative Tools

   b Double-click the **Services** shortcut.

   c Locate the **MySQL** service in the list, right-click and select **Restart**.

7 From the next dropdown, select **Create Database**, then click **Go**.

8 Click **Yes** to confirm the operation.

9 When you see the message **Operation Succeeded**, click **OK**.

Configuring the LiveTouch Manager VM

Now you are ready to configure the LiveTouch Manager so that it knows which ports on the LiveTouch Server it can use:

1 On the ISA Desktop, open the folder: **LiveTouch**.

2 Right-click **LiveTouch-Vx.x.x** and select: **Run as Administrator**.

3 In the User Account dialog, click **Yes**.

This opens a command window displaying debug information:

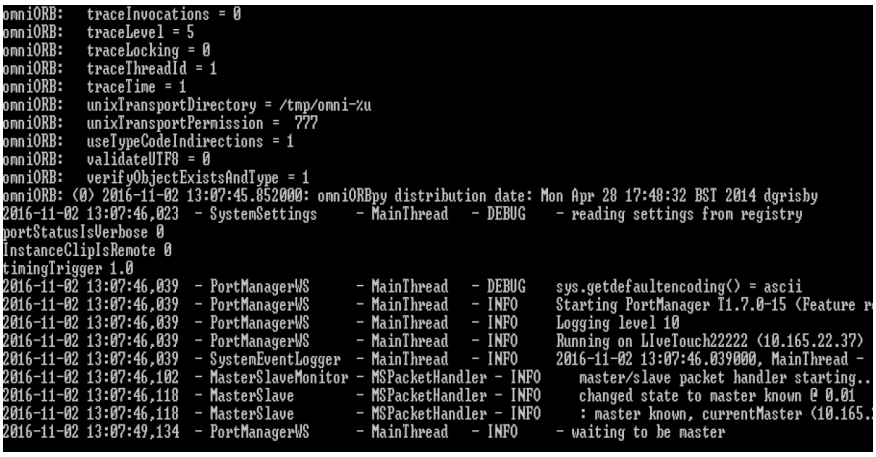


Fig. 6-64: LiveTouch Manager Setup - Debug Messages

4 Double-click the Desktop shortcut: **Dashboard (Vx.x.x)**

This should open the LiveTouch Dashboard in a Chrome browser window:

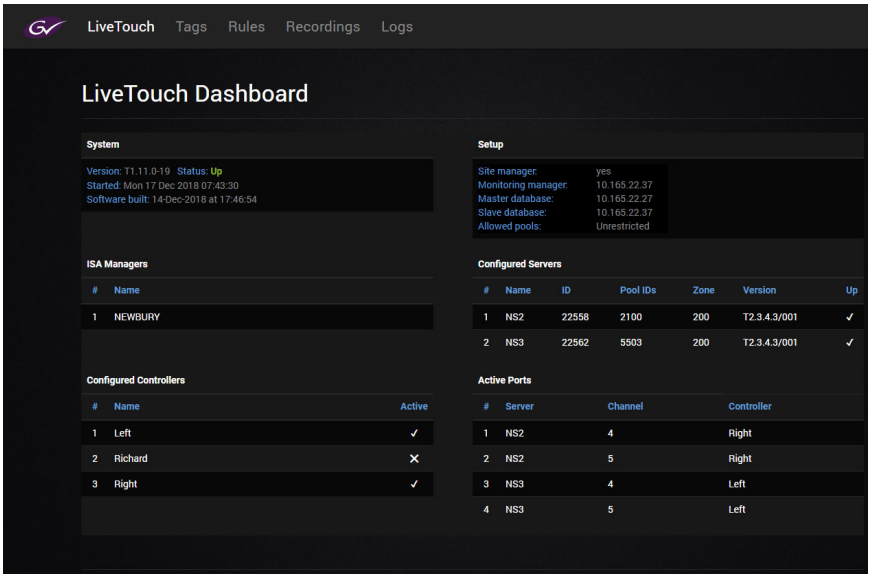


Fig. 6-65: LiveTouch Manager Dashboard (software version 1.10)

5 Confirm that the Dashboard runs correctly and that the settings are as expected.

6 On the Desktop Client PC, navigate to the Grassvalley folder:
Start: All Programs: Grassvalley: LiveTouch Vx.x.x.x

7 Right-click: **LiveTouch Vx.x.x.x Settings** and select **Run as Administrator**.

8 Click **Yes** to confirm that the settings can make changes to the Desktop Client.

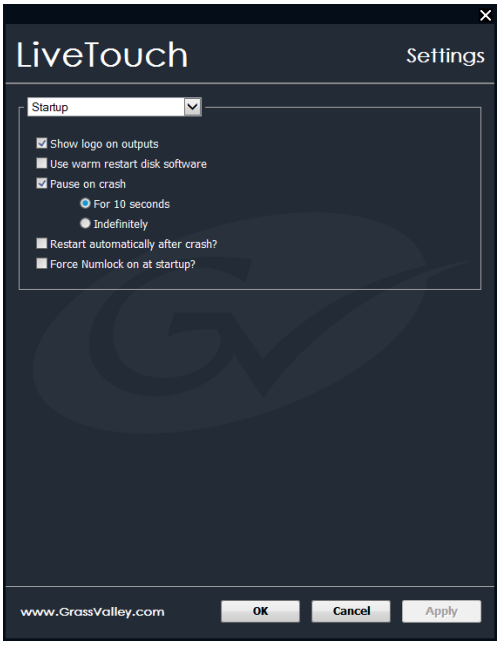


Fig. 6-66: LiveTouch Desktop Client PC - Settings Menu

9 Select **Network** from the dropdown menu to display the Network Settings.

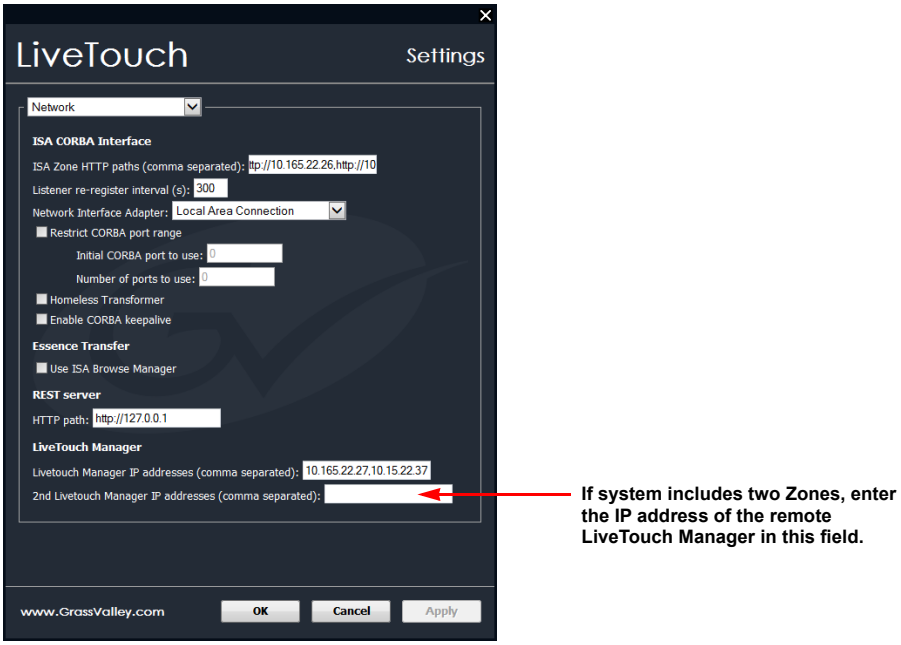


Fig. 6-67: LiveTouch Desktop Client PC - Settings Menu

10 In the field **ISA Zone HTTP paths** enter the IP address(es) for the LiveTouch Manager VM Master and Slave (if installed.)

Enter IP addresses for the ISA zone using the following comma-separated format:

http://<*IP_address_master*>,http://<*IP_address_slave*>

For example: http://10.165.22.26,http://10.165.22.36

11 For the LiveTouch Clipnet, confirm that the Desktop Client can receive video inputs i.e., that the video inputs are routed correctly from the LiveTouch server, via the ISA LiveTouch Manager VM, to the LiveTouch Desktop Client PC.

You can do so by opening a playout port and viewing the live recordings.

12 Click **OK** to apply your changes and exit the Settings menu.

13 Start the LiveTouch Desktop Client application.

Click **Close** to cancel the message: Looking for CUDA.

14 Check that the Desktop Client is connected to the LiveTouch Server.

15 Set the default LiveTouch user to: **LT1**

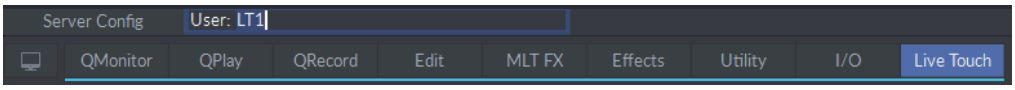


Fig. 6-68: LiveTouch Desktop Client PC - Setting-up Default User

16 Check the outputs and overlays.

Installing the Security Dongle on the Desktop Client PC

The optional LiveTouch software modules are licensed through the supplied dongle. Enable the dongle as follows:

1 Before starting-up the Desktop Client PC, insert the Dongle into one of the USB ports on the front panel of the Desktop Client PC.

2 Boot-up the Desktop Client.

3 Locate the Dongle in File Explorer - it should be displayed as **EchoID** - and click to view the locking code.

4 In File Explorer, browse to the folder **C:\Data** and open the license file: **lservrc.lic** in a text editor.

You should see the ordered LiveTouch options have been created according to the locking code on the security dongle.

5 Open the LiveTouch logfile and check that the valid locking code is listed.

6 If the optional Edit module is installed, set the network areas that can be accessed by the module, as described in the following steps.

7 On the ISA desktop, double-click the **SAM Manager UI** icon.

8 Enter the login details: **quantel / password** (defaults)

9 In the **ISA Manager** screen on the ISA, select **Configure Areas**.

10 Set the following parameters to inform the Client which Pools the ISA uses to look for clips:

- Area: **LT Server**

- Type: **Publish / Search**
- Name: **Pools**
- Value: **35800**

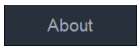
11 Click **Create**, then **Refresh DB**.

12 To confirm that the Areas have been configured correctly, you should see the LT Server listed in the Server Bin dropdown menu.

Setting the IP Address of the LiveTouch Panel

Start up the LiveTouch Panel and switch off the Unified Write Filter as follows:

1 Press the Settings softkey on the Panel.

2 Hold down the [**Shift**] key on the Panel and press the 

softkey to access the Windows maintenance mode on the Panel.

3 Select the **Maintenance** softkey.

4 On the LiveTouch Panel, touch the GrassValley logo and enter the password: **sam**.

This opens the Panel in maintenance mode.

5 Touch the screen in the top-right and drag down to the bottom of the screen to display the LiveTouch setup menu and select **Search**.

6 Enter **Emb** to load the Embedded Lockdown Manager.

7 Tap on **Unified Write Filter**, then tap on **Disable Unified Write Filter** in the Actions window.

8 Select **Restart Now** to reboot the LiveTouch Panel.

9 Repeat steps **1** through **4** to access the maintenance mode again.

10 Touch the Windows icon in the bottom-left of the screen and release on display of the menu.

11 Select **Command Prompt (Admin)** to display a command prompt window.

12 At the command prompt, enter: **netsh int ip reset reset.log**

13 Select **Restart Now** to reboot the LiveTouch Panel.

14 Repeat steps **1** through **4** to access the maintenance mode again.

15 Repeat steps **10** through **11** to access the command prompt again.

16 Set the static IP address, subnet mask and default gateway at the command prompt, enter:

netsh int ip set address ethernet static *<IP_address> <subnet_mask> <default_gateway>* **0**

For example:

netsh int ip set address ethernet static 10.162.46.213 255.255.0.0 10.162.254.10

17 Select **Restart Now** to reboot the LiveTouch Panel.

18 Repeat steps **1** through **6** to access the maintenance mode again.

19 Tap on **Unified Write Filter**, then tap on **Enable Unified Write Filter** in the Actions window.

20 Select **Restart Now** to reboot the LiveTouch Panel.

Set-up Comms Between Panel and Desktop Client

Point the LiveTouch at the Desktop Client as follows:

1 Press the Settings softkey on the Panel.

The icon is orange to indicate that the Panel is not yet connected to the Desktop Client.

2 Open the **Network** tab.

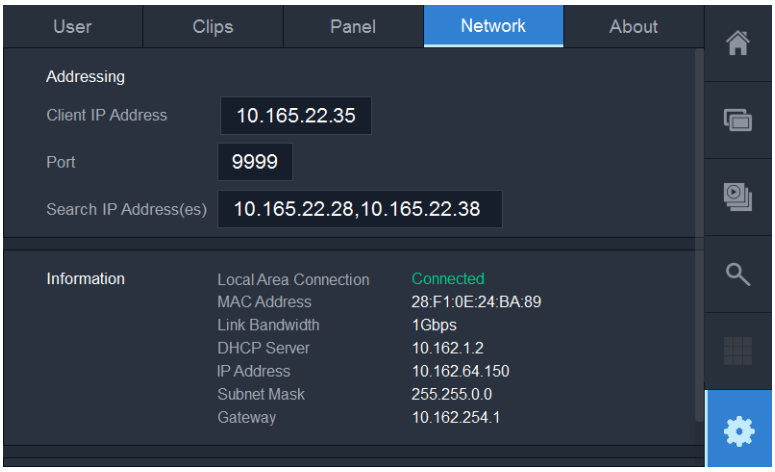


Fig. 6-69: LiveTouch Panel - Network Settings Menu

Note: For systems with more than one Zone, comma-separate the IP addresses in the field **Search IP Address(es)**.

3 Enter the Client IP address.

4 Check that all other IP addresses listed in the **Information** section are correct.

You should see the color of the Settings softkey change from orange to light-blue see Figure 6-69, indicating that the Panel is now connected. If you open the Clips tab, you should also see an empty Clips Library, starting at slot 100.

5 On the Client, check that the Live Recording tabs are displayed.

Checking the Installation of the LiveTouch Manager

Check that the LiveTouch Manager is installed successfully from the Desktop Client PC as follows:

1 Start the LiveTouch Client application from the Start menu.

2 Click **Server Config**.

3 Make sure that the expected Zone(s), Server(s) and Ports are displayed in the Server Config screen. If so, then the LiveTouch Manager is installed correctly.

Installing the LiveTouch Web Bin Software

Setting-up the Web Bin on the ISA Manager

The Web Bin service provides search functions and indexes for Playlists and clips available through the LiveTouch Manager. Install the Web Bin service on the Search VM running on the ISA Manager.

Install the LiveTouch Web Bin software on the ISA Search VM as follows:

1 Locate the LiveTouch Web Bin installation package: **LiveTouch-Web-Bin-V1.10.0.exe**, right-click and select **Run as administrator**.

For example: **LiveTouch-Web-Bin-V1.10.0.exe**

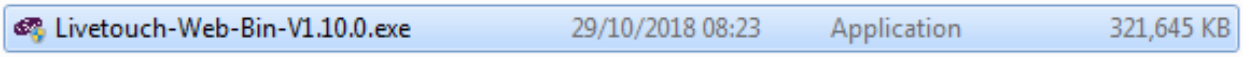


Fig. 6-70: LiveTouch Web Bin Executable in File Explorer

2 Click **I Agree** to accept the license terms and start the installation.

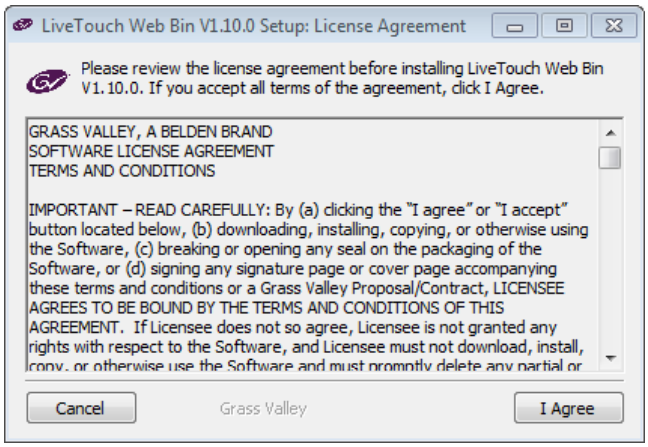


Fig. 6-71: LiveTouch Web Bin - License Agreement

3 Enter the IP address of the ISA Manager VM master, optional slave, and any other ISAs if installed.

Use the syntax:

<IP_ISA_Manager_master_1>,<IP_ISA_Manager_slave_1>/<IP_ISA_Manager_2>

For example, the following entry defines the IP addresses for two ISA managers in master - slave configuration and a standalone ISA Manager:

10.165.22.27,10.165,22.37/10.162.64.156

Set the server frame rate as follows:

- **24**
- **25** for 50 Hz systems
- **29.97** for 60 Hz systems.

Accept the default setting for port number: **9192**.

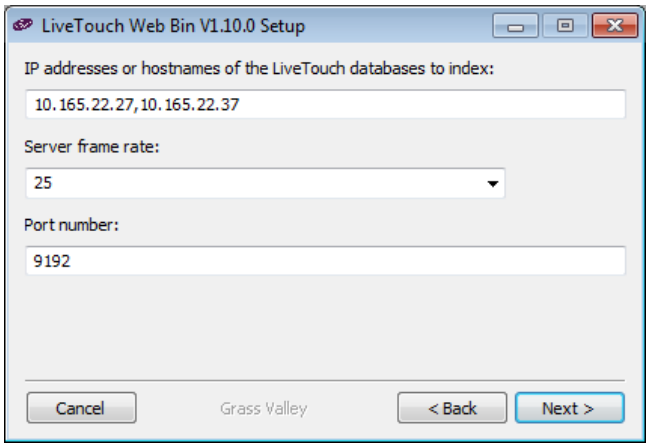


Fig. 6-72: LiveTouch Web Bin - Entering Target IP Address

4 Click **Next** to start the Web Bin installation.

The installer writes to the path:

C:\Data\livetouch-web-bin

The Web Bin installer creates the Windows services for the search service (**Solr**) and for the Web Bin service (**LiveTouch Solr Syncer**).

Log files are written to:

C:\Data\livetouch-web-bin\livetouch-solr-syncer\logs

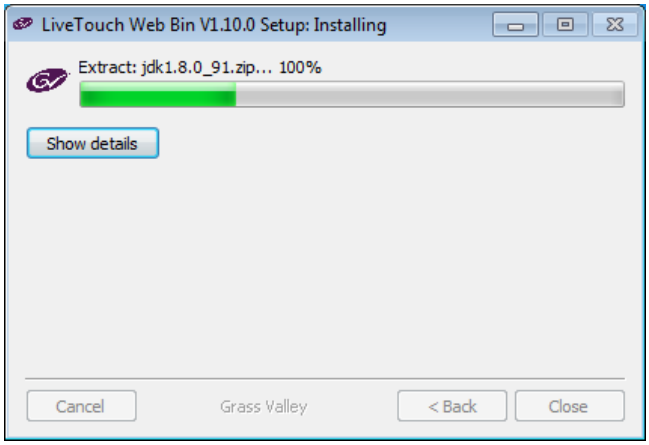


Fig. 6-73: LiveTouch Web Bin - Installation in Progress

5 On completion, click **Details** to view the Installation log, then **Close** to complete the Web Bin installation.

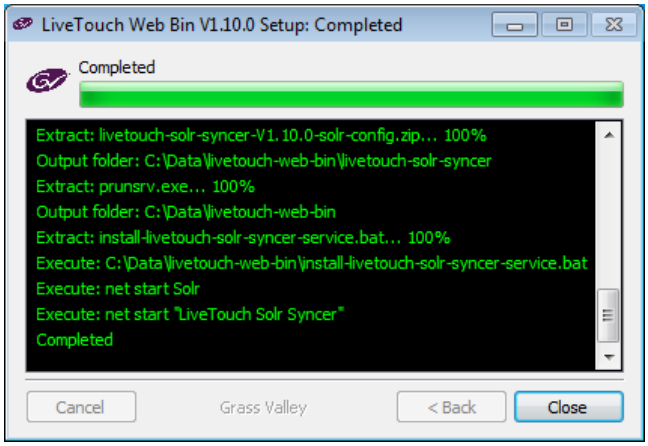


Fig. 6-74: LiveTouch Web Bin - Installation Log

The installer extracts the Java Virtual Machine (JVM), on which the Solr and LiveTouch Solr Syncer services run, run from a zip file in the installation folder.

6 Reboot the ISA Mangers to restart the Web Bin services.

7 Open the following links in a web browser to check that the Web Bin search services are running correctly:

http://localhost:8983/solr

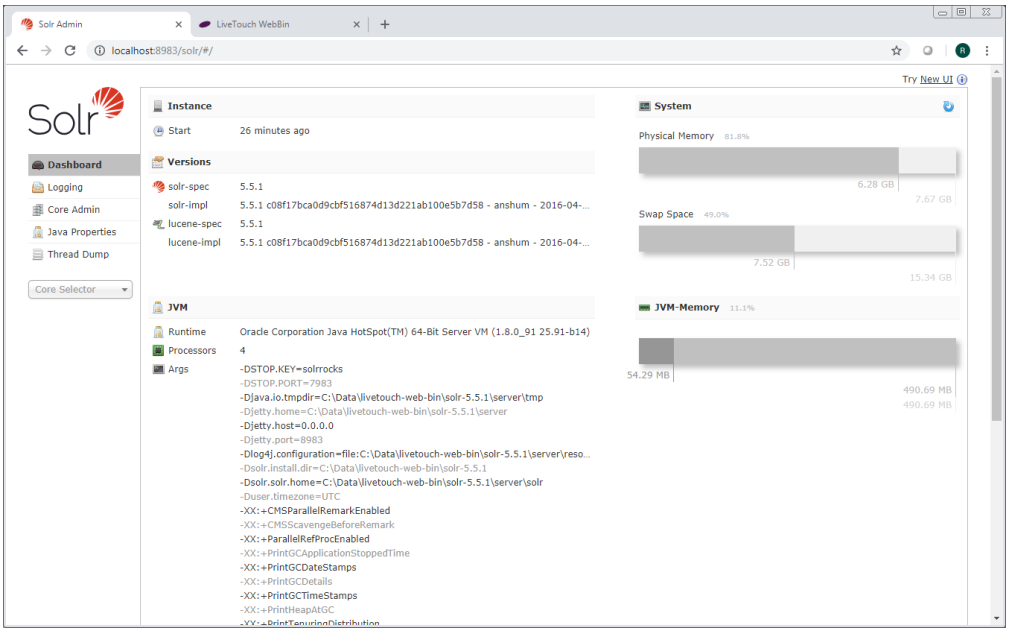


Fig. 6-75: Solr Service Dashboard

http://localhost:9192/livetouch-ui

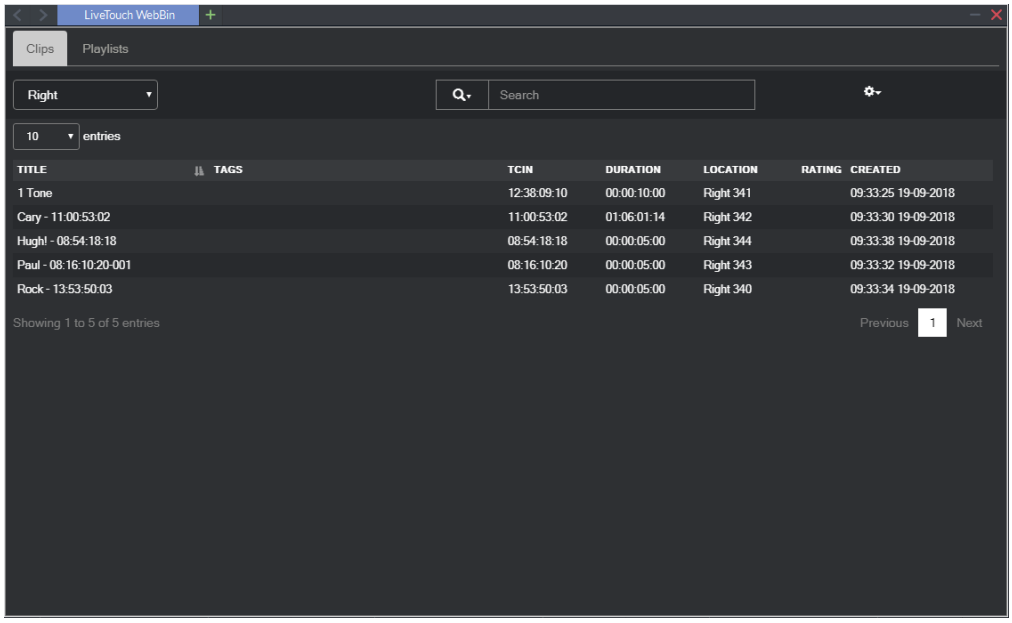


Fig. 6-76: LiveTouch Solr Syncer Web Bin Interface

8 Enter the following URL to check the version of the installed Web Bin software:
http://localhost:9192/livetouch-ui/version.xml

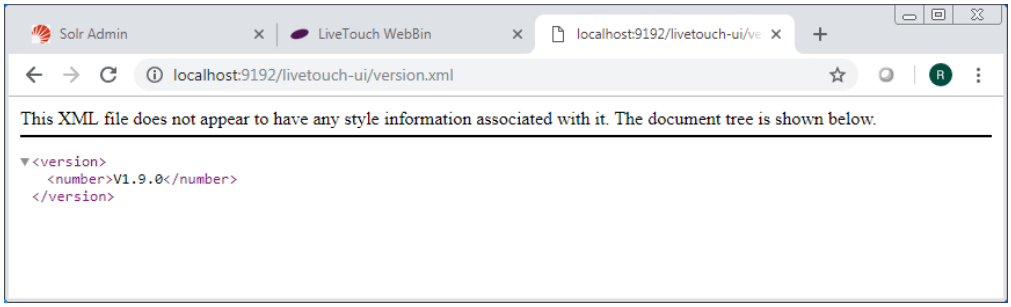


Fig. 6-77: LiveTouch Solr Syncer Web Bin Interface

Setting-up the Web Bin on the LiveTouch Desktop Client

Set-up the Web Bin on the LiveTouch Desktop Client as follows:

1 Browse to the folder:
C:\Data\LiveTouch V*x.x.x.x***\DLL_Data\Quantel\QChromiumEmbedded**

2 Copy the file **ExampleGenQBrowserURLs.xml** to **C:\Data\GenQBrowserURLs.xml**

3 Open the file **GenQBrowserURLs.xml** in a text editor, e.g., Notepad++.

```
<?xml version="1.0" encoding="utf-8"?>
<QuantelGenQBrowser>
<URLs>
  <url name="BBC" path="https://www.bbc.com/"/>
  <url name="WebBin" path="http://10.165.22.28:9192/livetouch-ui/#" launch_key_code="6"/>
  <url name="WebBin Slave" path="http://10.165.22.38:9192/livetouch-ui/#" launch_key_code="6"/>
  <url name="panelWebBin" path="http://10.165.22.28:9192/livetouch-ui/index-panel.html"/>
  <url name="Fileflow" path="http://10.165.250.189:8080/fileflowqueue/#" launch_key_code="6"/>
</URLs>
</QuantelGenQBrowser>
```

Fig. 6-78: Content of Web Bin Configuration file: GenQBrowserURLs.xml

4 Enter the IP Address of the Search VM on the ISA Manager master running the Web Bin in the section:

<url name="WebBin" path="http://10.165.22.28:9192/livetouch-ui/#" launch_key_code="6"/>

The entry **launch_key_code="6"** alows the keystrokes <**Ctrl**> + <**F**> to load the webpage on the LiveTouch Desktop Client.

5 If running master / slave ISA set-up, enter the IP Address of the Search VM on the ISA Manager slave running the Web Bin in the section:

<url name="WebBinSlave" path="http://10.165.22.38:9192/livetouch-ui/#" launch_key_code="6"/>

6 Save your changes to the file as: **GenQBrowserURLs.xml**

7 Open the Settings configuration menu on the Desktop Client by navigating to the Grassvalley folder:

Start: All Programs: Grassvalley: LiveTouch Vx.x.x.x

8 Right-click: **LiveTouch Vx.x.x.x Settings** and select **Run as Administrator**.

9 Click **Yes** to confirm that Settings can make changes to the Desktop Client.

10 Select **Browser Settings** from the dropdown menu to display the Browser Settings.

Fig. 6-79: LiveTouch Desktop Client PC - Web Bin Browser Settings

11 Confirm that the path to the Web Bin XML file is correct in the **Web Tools, URL file path**:

C:\Data\QChromium\GenQBrowserURLs.xml

Setting-up the Web Bin on the LiveTouch Panel

Set-up the Web Bin on the LiveTouch Panel as follows:

1 Click the Settings softkey and open the **Network** tab.

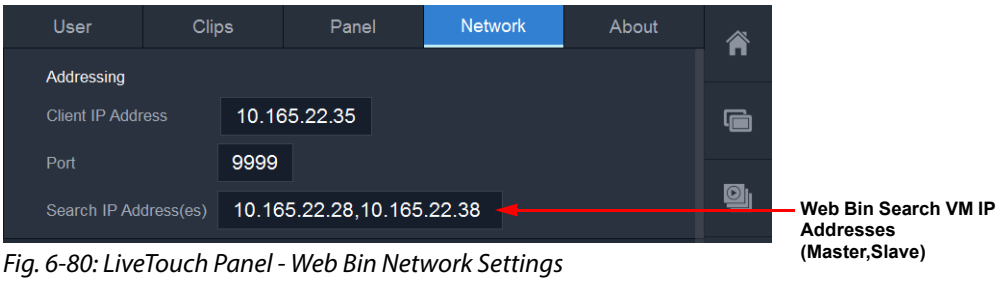


Fig. 6-80: LiveTouch Panel - Web Bin Network Settings

2 In the field Search IP Addresses, enter the IP address of the Search VM on the ISA Manager master (and slave if included.)

If specifying multiple addresses, use comma-separated values.

LiveTouch Unable to Read Dongle Locking Code

On occasion you may experience a compatibility issue whereby LiveTouch software, running on a Windows 10 PC, is unable to access the license dongle. This can result in the software failing to run-up as a result of licensing issues.

Reverting Windows 10 back to the previous version resolves this issue as follows:

1 Open the LiveTouch Properties dialog.

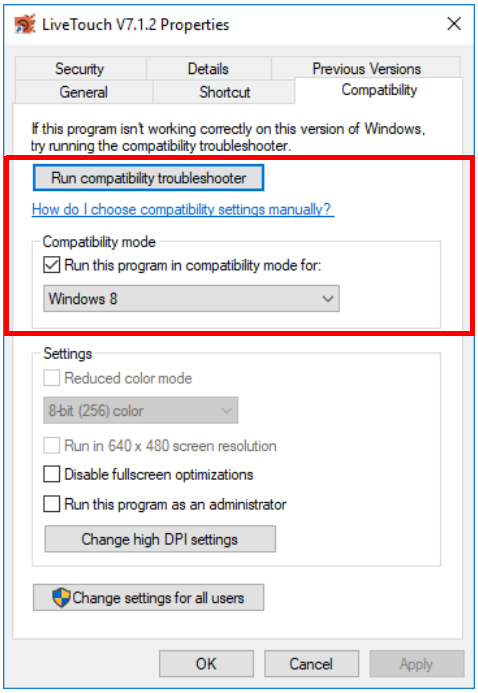


Fig. 6-81: LiveTouch Panel - Web Bin Network Settings

2 Set the Compatibility mode for Windows 8 and click OK to save your changes.

Setup LiveTouch Starring and Tagging

LiveTouch provides clip starring and tagging functions, which enable users to rate or label clips for ease of identification, further processing, partitioning by type, etc.

Clip tagging is available from both the LiveTouch Panel and Desktop Client application. Before clip tagging can be used, a tag sheet or team roster must be uploaded to the LiveTouch Manager Web Page.

Tag sheets must be created and saved in CSV format, with tags listed by number and name. It is also possible to upload team rosters to the LiveTouch Manager in XML format.

Loading Event Tag Sheets and Roster Files

You can apply event ***tags*** to your clips and in so doing, automatically apply metadata, which is saved with the clip. As with the star ratings, tags can also be used in the LiveTouch Manager rules to define triggers that start automated actions in the background. You can apply tags of the following types:

- Event tags
- Team roster tags

Clip tagging requires you to upload a **Tag Sheet** and an optional **Team Roster** to the LiveTouch Manager Web Page.

Source Tag Type	Required Format	Description
Event Tag Sheet	CSV File	Use to label significant events in a clip, for example, in soccer, this might include, for example, goal, penalty, offside, foul, etc. In the source file, tags must be listed by number and name.
Roster File	XML File	Use to define team members, competition personnel, etc. It is also possible to upload team rosters to the LiveTouch Manager in XML format. For a list of supported formats, please contact your product specialist.

It is important to note that tags, rosters and their underlying rules are usually defined and loaded as part of the LiveTouch implementation process and should be available for use in the Panel.

Note: If you need to make changes to the preconfigured tags or rules, contact your product specialist.

Load the Tag source files onto the LiveTouch Manager as follows:

1 Open the LiveTouch Manager dashboard. Enter the following in a web browser:
http://*<LiveTouch_Manager_IP_address>*:*<port>*

2 Switch to the tab: **Tags**

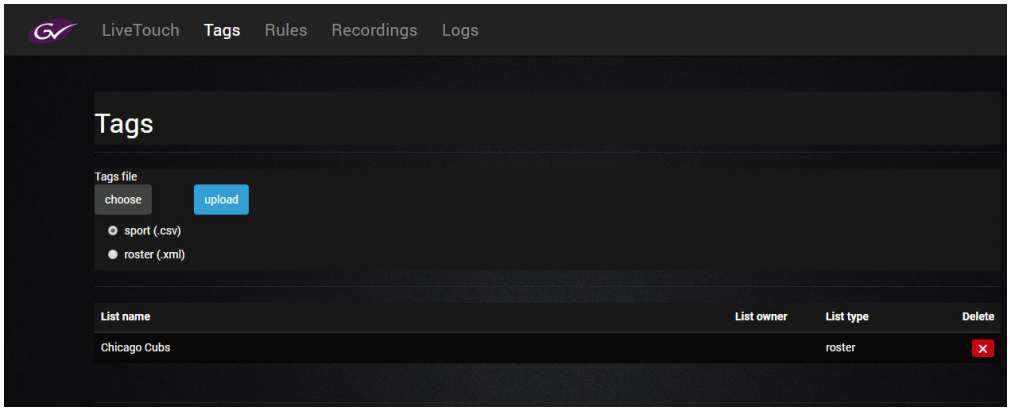


Fig. 6-82: Loading Tag Source Files on the LiveTouch Manager

3 Select the appropriate option for the file you want to upload from:
   - sport tags (.csv)
   - roster tags (.xml)

4 Click the **choose** softkey to open a file explorer window and browse to the CSV or XML file you want to upload, then click **Open**.

5 Click the upload softkey to upload the selected file.

   You should see the message **successfully imported** displayed, and the name of the tags list added to the top of the **List name** column.

To delete a set of tags from he listing, press ✕.

Configuring User Rules in LiveTouch

A critical component of live sports broadcasting is the ability to initiate the transfer of files to other integrated systems and to share media with other users and functional areas. LiveTouch provides a facility to define a set of ***user rules*** on the LiveTouch Manager, which can be used by the LiveTouch starring and tagging functions to trigger file transfer workflows, enabling enhanced media sharing.

A LiveTouch rule triggers its associated action when the controller and tag match. Once applied to a clip or clips, the associated background process is triggered by the LiveTouch Manager when one of the preconfigured rules matches the tag.

Rules are defined and managed in the **Rules** tab of the LiveTouch Manager dashboard and each rule includes the following data elements:

Element	Description
Enabled	Use the toggle button to enable or disable the corresponding rule. Set to Enabled ✓ or Disabled ✕.
Controller	Defines the name of the port controller in use by the LiveTouch user.
Name	Unique name assigned to the rule when creating a new rule. Enter a text string that will help to identify the rule.
Trigger	Star rating or tag, applied to a clip using the LiveTouch Panel or Desktop, and used to trigger the rule for the matching controller. A trigger can be any of the following: • Slot range, for example: **slots 800-900** • Star rating, for example: **1 star**, **2 star**, **3 star** • Tag, for example: **tag goal**
Pools	Pool or pools to which the rule applies. Enter one or more pools separated by commas. For example: **2100, 2200**
Category	Use to assign a metadata element **category** to the target clip. Define the metadata using *tokens* delimited by braces **{ }** with each item separated by a comma. For example: {*Controller_Name*}, {*Tags*}, (*Slot_Number*}, {*Date*}, {*Time*}
Owner	Use to assign a metadata element **owner** to the target clip. Define the metadata using *tokens* delimited by braces **{ }** with each item separated by a comma. For example: {*Controller_Name*}, {*Tags*}, (*Slot_Number*}, {*Date*}, {*Time*}
Description	Use to assign a metadata element **description** to the target clip. Define the metadata using *tokens* delimited by braces **{ }** with each item separated by a comma. For example: {*Controller_Name*}, {*Tags*}, (*Slot_Number*}, {*Date*}, {*Time*}
Delete	Use to delete an unused rule. Click ✕ to delete a rule.

Typical actions triggered by a rule might be:

- Export to the FileFlow application
- Publish a clip to a designated server.

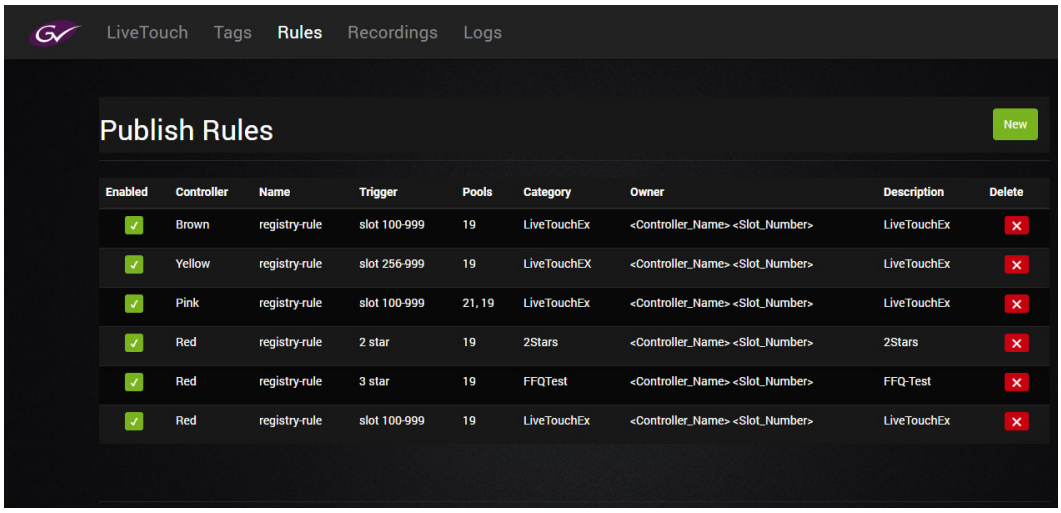


Fig. 6-83: Defining a Rule on the LiveTouch Manager for Star Ratings and Tags

7 Specifications

Overview

This section defines the specifications of the various components making-up a LiveTouch system.

LiveTouch Server Specifications

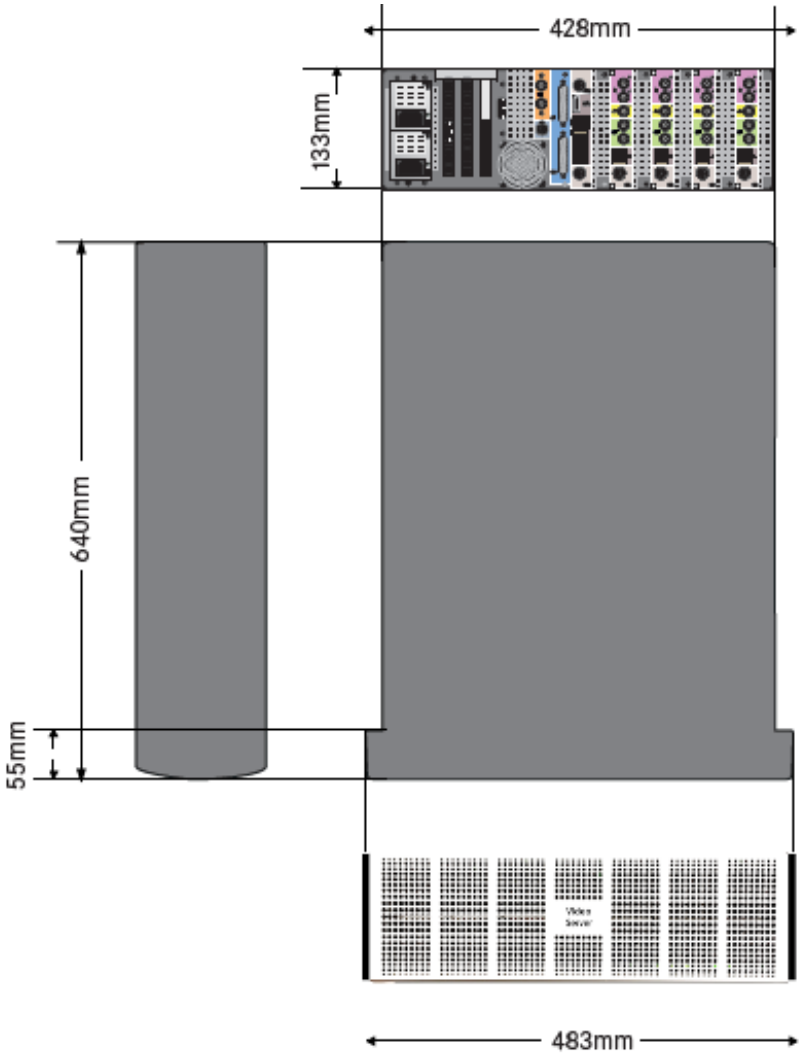


Fig. 7-1: sQ 1200 and sQ 1800 Server Dimensions

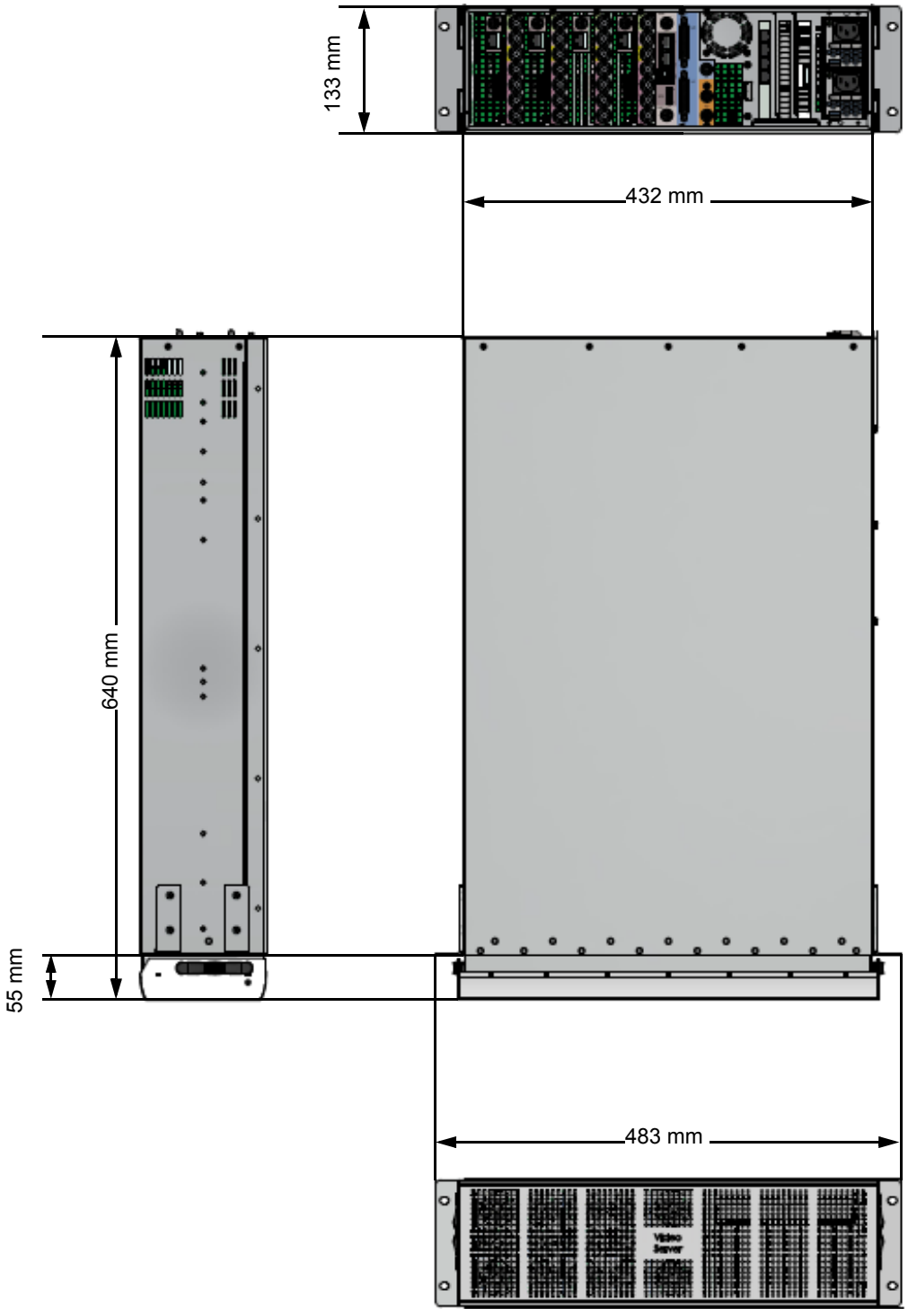


Fig. 7-2: sQ 1200-12G Server Dimensions

LiveTouch Server Interface Cards

Video Network Card	
Item	**Description**
Internal Name	Clipnet
Interfaces	Quad 1GbE, or Dual 10GbE (optical or copper)
Protocol	GV Clipnet QCP and STTP

Video and Audio Connectors	
Inputs	
Connector type	BNC x 1 per port 270 MHz / 1.5 GHz / 3 GHz: Up to 12 SD/HD/1080p video ports 12 GHz: Up to 4 UHD ports
Input Impedance	75 ohm
Max Cable Length	270 MHz / 1.5 GHz / 3 GHz: 100 m of Belden 1694A 12 GHz: 60 m of Belden 1694A
Standards	Each input allows the platform to accept bit serial SD video conforming to ITU-R BT. 601-5 & ANSI/SMPTE 259M-2008 with embedded audio packets conforming to ANSI/SMPTE 272M or HD video conforming to SMPTE 292M & 424M with embedded audio packets conforming to SMPTE 299. ANSI/SMPTE 272M (Formatting AES/EBU Audio into Digital Video Ancillary Data Space 48KHz synchronous). SMPTE 292M (Bit-Serial Digital Interface for High-Definition Television Systems). SMPTE 424M (3Gb/s Signal/Data Serial Interface) SMPTE 299M (24-Bit Digital Audio Format for HDTV /Bit-Serial Interface)
Outputs	
Connector type	BNC x 1 per port 270 MHz / 1.5 GHz / 3 GHz: Up to 12 SD/HD / 1080p video ports 12 GHz: Up to 4 UHD ports
Input Impedance	75 ohm
Max Cable Length	270 MHz / 1.5 GHz / 3 GHz: 100 m of Belden 1694A 12 GHz: 100 m of Belden 1694A
Standards	Each input allows the platform to accept bit serial SD video conforming to ITU-R BT. 601-5 & ANSI/SMPTE 259M-2008 with embedded audio packets conforming to ANSI/SMPTE 272M or HD video conforming to SMPTE 292M & 424M with embedded audio packets conforming to SMPTE 299.

Video and Audio Connectors	
Audio	
Embedded Audio	The sQ 1200, sQ1200-12G and sQ 1800 servers have embedded audio via the SDI bit-serial digital video connection ports.
Channels	Up to 16 (record and playback) for embedded SDI audio.
Features	V-Notch on discontinuous media. • 16-bit and 24-bit • Freely intermix different audio formats on playback. • Automatic fade up / down.
Clipnet Video Network	
Three Clipnet options are available:	• Quad Gigabit • Dual Ten Gigabit – Copper • Dual Ten Gigabit – Optical
Quad Gigabit	Copper interface with RJ45 connections: • 1000 BASE-T • Network carrier: 1000 BASE-T Gigabit Ethernet • Connector type: RJ45 • Cable type: CAT 5E • Maximum expected operating distance: 100 m (if patch panels are used, this will reduce) • Communication protocols: TCP/IP & UDP/IP
Dual Ten Gigabit – Copper	Copper interface with RJ45 connections: • 10G BASE-T • Network carrier: 10G BASE-T • Connector type: RJ45 • Cable type: CAT 6A • Maximum expected operating distance: 100 m (if patch panels are used, this will reduce) • Communication protocols: TCP/IP & UDP/IP
Dual Ten Gigabit – Optical	Optical interface with SFP LC connections: • 10G BASE-SR • Network carrier: 10G BASE-SR • Connector type: LC • Cable type: 50/125 µm or 62.5/125 µm Fibre • Maximum expected operating distance: Up to 300 m dependent on type • Communication protocols: TCP/IP & UDP/IP

Video and Audio Connectors	
System Network Interface	
The platform provides a 1000 BASE-T Ethernet (RJ45) connection to allow control by the ISA Manager.	• Network carrier: 1000 BASE-T Gigabit Ethernet • Connector type: RJ45 • Cable type: CAT 5E • Maximum expected operating distance: 100 m (if patch panels are used, this will reduce). • Communication protocols: TCP/IP & UDP/IP

Maximum Number of Channels

Supported Resolutions	Max No. of Channels
1080i / 720p / SD	Up to **12**
1080p	Up to **8**
2160p	Up to **4**

Supported SDI Standards

Item	Description
Standards	• SD-SDI SMPTE-259M, 10-bit • HD-SDI SMPTE-292M, 10-bit • 3G-SDI SMPTE-424M, 10-bit, Level A & B • ST 425-5 Quad Link 3G, 10-bit • SD embedded audio ANSI/SMPTE 272M • HD embedded audio SMPTE 299M
Connector	BNC 75 ohm 100 m length of Belden 1694A cable for all standards

Supported Video Compression Formats

Standard	Details	Description
SD	• 525i 59.94 • 625i 50	• IMX • DV • DVCPRO
HD	• 1080i 59.94 • 1080i 50 • 720p 59.94 • 720p 50	• DVCPRO HD • AVC Intra • DNxHD • XAVCi
1080p (Level A & B)	• 1080p 59.94 • 1080p 50	• AVC Intra • DNxHD • XAVCi
UHD	• 2160p 59.94 • 2160p 50	• H.264

Supported Proxy Compression Formats

Standard	Details	Compression
SD	• 525i 59.94 • 625i 50	• MPEG-1 Long GOP at 1.5 Mb/s • H264 at 2.5Mb/s
HD	• 720p 59.94 • 720p 50	• H264 at 12Mb/s (UHD Only config)

Note: Proxy generation is not included in all LiveTouch configurations.

Supported Audio Formats

- 16 Channels embedded SDI audio per channel
- Up to 192 channels per system
- SD embedded audio ANSI/SMPTE 272M
- HD Embedded audio SMPTE 299M
- 16-bit and 24-bit depth
- 48 kHz sampling rate
- Soft clipping in discontinuous clips, at starts and stops
- V-Notch, fades to and from silence
- Freely intermix different audio formats on playback
- Audio input patching
- Audio output patching

Environmental Specifications

Environmental Specifications	
Minimum Operating Ambient Temperature:	10°C (50°F)
Maximum Operating Ambient Temperature:	30°C (86°F)
Absolute Safe Maximum Ambient Temperature:	40°C (104°F)
Maximum Relative Humidity (RH):	90% (non-condensing)

Power Specifications

The LiveTouch Server power supplies are dual-redundant and hot swappable.

Power Specifications	
Mains Rating:	Dual Source: 90 - 264 V The equipment is designed to operate with a mains supply tolerance of +6% and -10% of the rated values.
Mains Input Frequency:	50 / 60 Hz
Inrush Current (peak):	60 A Max for 115 V AC per module 30 A Max for 230 V AC per module.
Input Connector:	IEC320 C14

Power Specifications	
Efficiency:	Typical: 85% at 115 V AC 80% at 240 V AC
Earth Leakage Current:	Less than 1.5 mA (both)
Isolation Device:	The socket is the disconnect device for equipment isolation. **WARNING:** The mains electrical supply connections to both power supply units must be removed to give complete electrical isolation.
Maximum power Consumption:	1100 W

Reference Signal Specifications

Reference Specifications	
Locking Reference	Connection: Passive loop-thru 75 ohm BNC • SD: NTSC/PAL black and sync • HD: SMPTE 296M-2001 Tri-Level for 720p • SMPTE 274M-2008 Tri-Level for 1080i/p • All system video outputs genlock to locking references. The system's video inputs can be asynchronous to the server locking reference. • There are two reference connections. The reference input is a low return loss, low impedance connection, which accepts an SD or HD analogue reference signal. The passive loop through connector can be connected to other equipment and must be terminated to 75 ohm. • The 525/59.94 or 625/50 signal can be a Black & Burst video signal (300 mV sync) with VITC (vertical interval timecode).

Reference Specifications	
Reference TImecode	The platform extracts VITC (vertical interval timecode) from this external locking reference to provide the system with a studio time reference. The default lines from which VITC are extracted are: PAL Lines 19 and 21 and NTSC Lines 16 and 18.
LTC Input	The platform provides a longitudinal timecode input as an alternative to the VITC on the locking reference input. The LTC source must be locked to the locking reference. • Connector type: Mini Din KMDLX-4S-BS (XLR interface cable available on request) • Input impedance: 10 kohm differential • Input amplitude: 500 mV to 1 V

Storage Option Specifications

Storage Option Specifications	
sQ 1200 / sQ1200-12G Internal Storage	• 8 Bay Carrier • 8 x SAS 2.5" HDD • RAID 3 (7+1) • SAS 3Gb/sec interface
sQ 1800 External Storage	Xyratex Onestor 2U24 Ebod (96-11-1453) • 24 x SAS 2.5" HDD • 2 x SAS SFF8088 Cables • 1 x Onestor Disk Drive unit • 1 x Ebod racking kit (55-02-0739) • RAID 30 (3 x 7+1) • SAS 6 Gb/sec interface • Redundant and hot swap power supplies

LiveTouch ISA Manager Specifications

Fig. 7-3: LiveTouch ISA Manager Front Panel

System Specifications	
ISA Base System 1 - Mid Performance (X10-96-11-1704)	
Chassis	SuperMicro 1028R-WTRT
Motherboard	Supermicro X10DRW-iT ASPEED AST2400 on-board graphics 10 × 2.5" disk slots Dual redundant 750 W power supply units (80-Plus Gold) Intel x540 Dual Port 10 Gigabit Ethernet See full specification at www.supermicro.com
Memory	8 × 8 GB 2133 MHz REC ECC DDR4 DIMMs Configured to obtain maximum bandwidth Samsung part number: Samsung M393A1G40DBCPB Supermicro part number: MEM-DR480L-SL01-ER21
CPU	2 x Xeon E5-2690 v3 2.6 GHz 12 cores / 24 threads 4-channel memory controller 256 kB L2 cache – per core 30 MB L3 cache – shared between all cores 2 × 9.6 Gbit/s QPI links
Hard Disk Drives	2 × Toshiba THNSNJ240PCSZ SSDs – Configured as RAID-1 240 GB SATA3 (6 Gbit/s)

System Specifications	
Processors	Single or dual Intel® Xeon E5-2600 v3/v4 Series processors
Chipset	Intel PCH-C612 Chipset
BIOS	128 MB SPI AMI BIOS® SM Flash UEFI BIOS
Memory Capacity	Sixteen (16) DIMM slots that can support up to 2048 GB of ECC RDIMM or LRDIMM DDR4 2400/2133/1866/1600 MHz speed memory in 1 GB, 2 GB, 4 GB, 8 GB, 16 GB, 32 GB, 64 GB and 128 GB size @ 1.2V voltage.

System Specifications	
Drive Bays	Ten (10) 2.5" SATA-3 hot-swap drive bays
System Cooling	Four (4) 4-cm counter-rotating fans

Input Power Specifications	
AC Input Voltage	100 VAC to 240 VAC (auto-range)
AC Input Rating	700 W: 100 - 140 V, 50-60Hz 750 W: 200 - 240V, 50-60Hz

DC Output Rating Specifications	
Rated Output Power	700/750 W
Rated Output Voltages	700 W: +12 V @ 58 A; +5 Vsb 3A 750 W: +12 V @ 62 A; +5 Vsb 3A

Operating Environment Specifications	
Operating Temperature	0 °C to 50 °C (32 °F to 122 °F)
Non-operating Temperature	- 40 °C to 60 °C (-40 °F to 140 °F)
Operating Relative Humidity	8% to 90% (non-condensing)
Non-operating Relative Humidity	5% to 95% (non-condensing)

Regulatory Compliance	
Electromagnetic Emissions	FCC Class A, EN 55022 Class A, EN 61000-3-2/-3-3, CISPR 22 Class A
Electromagnetic Immunity	EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)
Safety	CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe) California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. "Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate"

The ISA Manager is usually only available as a turnkey product, however, if the LiveTouch ISA is purchased as the software-only option, then the PC selected to run as the ISA must meet or exceed the following minimum specifications:

Minimum PC Specifications (Software Only option)	
Base System	X10 #2 - Mid performance
CPU	Dual Intel Xeon E5-2630v3, 2.6GHz, 8-Core
Memory	8 x 8 GB RAM, 2133 MHz, REC ECC DDR4 (Dual Channel memory)
Graphics/Video	n/a
Hard disk	2 x 240GB SSD, SATA3 (6Gb/s), configured as RAID1
Sound Card	n/a
Networking	Dual Port 10 Gigabit Ethernet Jumbo Frame 9014 packet support - disabled by default
Display	n/a
Power	Dual 750 W PSUs
Operating System	Microsoft Windows Server 2012 R2.

Desktop Client PC Specifications

Technical Specifications	
Processor	
Processor type	Intel Core i3/i5/i7 series
Total cache	Up to 8 MB cache depending on processor type
Memory	
Type	DDR3
Speed	1600 MHz
Connectors	4 DIMM slots
Capacity	2 GB, 4 GB, and 8 GB
Minimum memory	2 GB
Maximum memory	32 GB
Video	
Integrated	Intel HD Graphics (Pentium CPU-GPU) Intel HD Graphics 4600 (i3/i5/i7 DC/QC Intel 8 Series Express chipset CPU-GPU Combo)
Discrete	PCI Express x16 graphics adapter
Audio	
Integrated	Two channel High Definition Audio
Network	
Integrated	Intel I217LM Ethernet capable of 10 / 100 / 1000 Mb/s communication
System Details	
System chipset	Intel 8 series Express chipset
DMA Channels	two 8237 DMA controllers with seven independently programmable channels
Interrupt Levels	Integrated I/O APIC capability with 24 interrupts
BIOS Chip (NVRAM)	12 MB
Expansion Bus	
Bus Type	PCIe gen2, gen3 (x16), USB 2.0, and USB 3.0
Bus Speed	PCI Express: • x1-slot bidirectional speed–500 MB/s• • x16-slot bidirectional speed–16 GB/s SATA: 1.5 Gbps, 3.0 Gbps, and 6 Gbps

Power Specifications	
Voltage	100 VAC to 240 VAC
Coin-cell battery	3 V CR2032 Lithium coin cell
Power Consumption	255 W
Maximum Heat Dissipation	870 BTU/hr

Physical Specifications	
Height	290 mm (11.42 inches)
Width	93 mm (3.66 inches)
Depth	312 mm (12.28 inches)
Weight (minimum)	6 kg (13.22 lb)

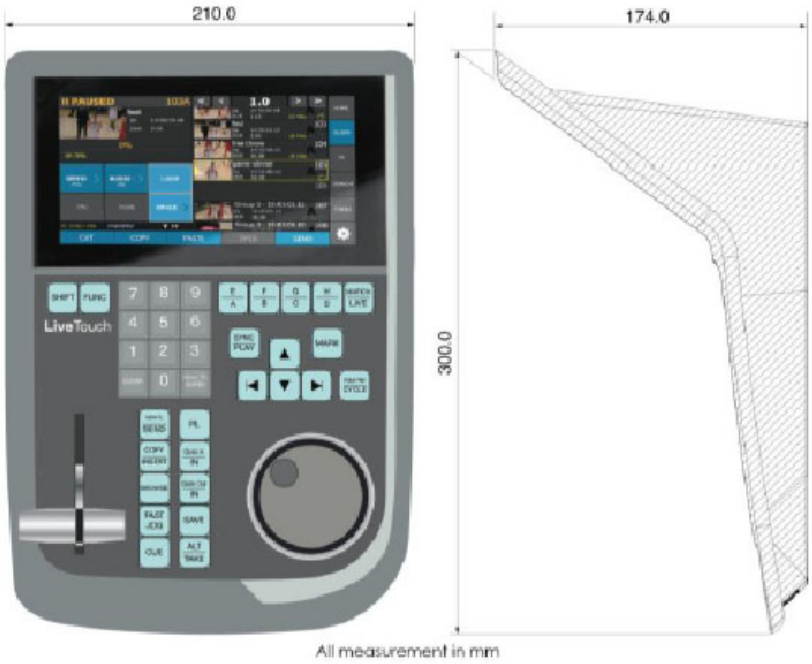
Environmental Specifications	
Operating Temperature	5 °C to 35 °C (41 °F to 95 °F)

If the LiveTouch Desktop Client is purchased as the software-only option, then the PC selected to run as the Desktop Client must meet or exceed the following minimum specifications:

Minimum PC Specifications (Software Only option)	
CPU	Intel 4th generation Core i7, Quad core, 3.6GHz (e.g. i7-4790K) or better
Memory	8 GB Dual Channel Memory
Graphics/Video	NVidia K620 or above. CUDA required. **Note:** If significant FX or color work is required on the Desktop Client, please consult your Grass Valley representative for the latest recommended GPU for high-quality editing, color and FX.
Hard disk	1 x 7,200 rpm SATA or SAS disk drive, 500 GB recommended with: 100 GB minimum available for Audio and Data partitions 300 GB minimum if using the optional LiveTouch Edit.
Sound Card	Windows 7 compatible sound card
Networking	1000 BASE-T networking with Jumbo Frame 9014 packet support.
Display	1920 x 1080 pixel minimum resolution

Minimum PC Specifications (Software Only option)	
Operating System	Microsoft Windows 7 Professional 64-bit
Keyboard/Mouse	Standard Windows compatible keyboard and mouse

LiveTouch Panel Specifications



Physical Specifications	
Height	174 mm (6.9 inches)
Width	210 mm (8.3 inches)
Depth	300 mm (11.8 inches)
Weight (minimum)	2.5 kg (5.5 lb)

Environmental Specifications	
Operating Temperature	5 °C to 35 °C (41 °F to 95 °F)

Power Specifications	
Input Voltage:	90 - 264 V AC
Input Current:	Maximum 1.7 A @ 90 V AC input
Output:	5 A 12 V
Earth Leakage Current:	Maximum 3.5 mA @ 230 V AC input

Note: As a result of continuous improvement, specifications are liable to change.

8 Product Support

Providing Information to Grass Valley

If you experience any technical or operational difficulties with a Grass Valley product please do not hesitate to contact us to request assistance.

There is a lot of information you can give us that will enable us to diagnose your problem swiftly. Please read the following guidelines, as these suggestions will help us to help you.

Basic Information

- **For Units:** Provide the exact product Model, unit Serial Number and Software Version information.

Software Application

- **Inputs:** Provide full details of the Input Signals being used including any references, etc., and where they are being generated.
- **Outputs:** Provide full details of the Output Signals required and how they are being monitored.
- **System:** Provide a brief description of the system in which your equipment is currently being used.

Your Contact Details

In addition to the above, remember to provide us with your contact details to enable us to get in touch with you swiftly:

- Name(s)
- Telephone
- E-mail addresses
- Business address
- Contact Details

Customer Support

For details of our Regional Customer Support Offices, please visit the Grass Valley website and navigate to Support/Contacts Support.

http://www.grassvalley.com/support

Customers with a support contract should call their personalized number, which can be found in the contract, and be ready to provide their contract number and details.

Contact Us

Grass Valley Technical Support

For details of our Regional Customer Support Offices please visit the Grass Valley web site and navigate to: **Support > Customer Care**.

https://grassvalley.com/support

Customers with a support contract should call their personalized number, which can be found in their contract, and be ready to provide their contract number and details.

Corporate Head Office

Grass Valley
3499 Douglas-B.-Floreani
St-Laurent, Quebec H4S 2C6
Canada
Telephone: +1 514 333 1772
Fax: +1 514 333 9828
www.grassvalley.com